The RUBBER AGE

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The RUBBER AGE

VOL. 23. No. 5 JUNE 10, 1928

Rubber Institute Established To Correct Unsound Merchandising Practices

Forty-two Companies Become Charter Members of New Organization At Meeting on June 1st—General Andrews to be Active Head of Institute—Fifteen Are Chosen As First Directors

AN entirely new cooperative organization to be known as The Rubber Institute, Incorporated, and having the announced purpose of correcting the uneconomic merchandising practices so prevalent in the rubber industry, was formed on June 1 when 42 rubber companies signed up as charter members at an organization meeting presided over by Brigadier-General Lincoln C. Andrews who will be the first director-general. Since all the largest rubber companies in the United States are included among the charter members, there is no question of the financial stability or influence of the new Institute. Twelve of the best known companies were instrumental in getting the movement started.

The Institute's program, briefly expressed, is to put an end to "profitless prosperity" by means of "cooperation in competition" instead of carrying competition to the point where there is no profit, or an actual loss, on an enormous volume of business. In working out such a program the Institute will be closely guided by the appropriate officials in Washington who will be asked to pass on certain of the cooperative measures which will be tried out. This requirement, which is regarded as a most important one, is looked upon as making the leadership of General Andrews particularly fortunate since he has established contacts at Washington which should be of the greatest help.

At the organization meeting, which was held at the Plaza Hotel, New York City, on the morning of June 1, General Andrews announced that the movement to have such an Institute formed became prominent about the middle of May when a meeting was held in Akron by representatives of some of the largest companies. Two preliminary meetings were held and on May 23 it was publicly announced that the organization meeting would be held on June 1. All manufacturing members of the rubber industry were invited to attend. The preliminary announcement had coupled with it the names of twelve prominent manufacturers who had agreed upon the desirability of such an organization.

42 Companies Sign Up

At the meeting at the Plaza there were about 70 companies represented and, as noted above, 42 of them immediately enrolled as charter members. Many other companies who have not yet signed are expected to do so and the membership of the organization will remain permanently open to all the industry.

The signing of the charter members was followed by the election of the first board of directors. Fifteen directors were chosen, five from companies having annual sales of more than $50,000,000, five from companies having annual sales of between $10,000,000 and $50,000,000, and five from companies having annual sales of less than $10,000,000. The names of these directors are shown on the next page.

Director General of
THE RUBBER INSTITUTE, Inc.

Brig. Gen. Lincoln C. Andrews

With the election of the first board of directors and the insertion of their names in the articles of incorporation, everything was ready for the formal launching of the new organization. General Andrews announced, however, that before the incorporation papers were filed he would take them to Washington for examination by the Department of Justice and the Federal Trade Commission. If either of these bodies found fault with any of the avowed purposes of the organization, proper alterations would be made before the papers were filed.

Purpose of Institute

The declared purpose of the Rubber Institute is as follows:

"To promote in the industry a mutual confidence and a high standard of business ethics; to eliminate trade abuses; to promote economic business customs and practices; to foster wholesome competition; to provide ultimately for individual efficient business management, operating independently, an opportunity to do business with an adequate return; and thus generally to promote the service of the industry to the public welfare."

In general, the effort of the Institute will be to replace ignorant, destructive competi-

tion with wholesome competition. "There seems to be no other alternative," General Andrews said, "to the continuance of the present unsatisfactory conditions, to the 'profitless prosperity' that seems to be your present lot. The remedy will not be found in combinations and mergers looking toward monopoly, nor in price fixing or other illegal short cuts which invariably return to plague you."

The chief step in the elimination of destructive competition will be the public announcement by members of the Institute of their selling prices and the uniform application of such prices after they are announced. This principle of announced prices is the principal plank in the "organization declaration" which the charter members signed. It is printed in full on the adjacent page, together with the names of the signers. This point aroused more comment than any other at the organization meeting. Having made certain prices and announced them, a member would be expected to adhere to them or announce any changes at once thereafter.

Gen. Andrews Sole Head

The Rubber Institute will have no elected officers. General Andrews will be director-general, corresponding to president. He will have the assistance of an executive committee which he will choose from the board of directors. It has been felt that many such organizations have had their opportunities for service nullified by the fact that they were headed by a representative of some one company. General Andrews has made it clear that he is not to be regarded as a "czar" or dictator since he intends to be more a confidential advisor to all the member companies.

The question of over-lapping of functions with the Rubber Association of America, Inc., which for 28 years has been the central organization of the rubber manufacturing industry in the United States, occurred immediately to many persons. This possibility was dismissed by the director-general in a single sentence, as follows: "In regard to the Institute's relations with the Rubber Association of America, Mr. Litchfield, Mr. Viles and I have discussed this matter frankly and are confident that we can function without over-lapping, and in close co-operation." P. W. Litchfield, president of the Goodyear Tire & Rubber Company, is president of the Rubber Association and A. L. Viles is its general manager.

Without greater clarification, most of the industry is left in the dark as to how the two organizations will proceed "without over-lapping," since it has been customary to handle merchandising problems, as well as service matters, through the various divisions of the Rubber Association. With the Institute taking over all the principal merchandising problems, the Association would be left chiefly as a service organization in which field it has already made an enviable record.

While the charter membership of the Institute is much less numerically than the present membership of the Association, several companies which have withdrawn from the Association in the past, or which never became members, have signed up with the new organization. Most prominent in this group is the Firestone Tire & Rubber Company which withdrew from the Association in 1923 following the disagreement of Harvey S. Firestone with the Association's method of handling the rubber restriction question. Other non-members of the Association who will be members of the Institute are the Lee Rubber & Tire Corporation, the Overman Cushion Tire Company, the Cord Tire Corporation and the Manhattan Rubber Manufacturing Company.

Will Locate in New York

General Andrews and his secretary have been occupying temporary quarters in the offices of the United States Rubber Company at 1790 Broadway, New York City. The establishment of permanent offices will be followed soon and it is now contemplated that they will be in the new office building at 1776 Broadway at the corner of 57th Street.

General Andrews comes to his post as head of the Institute well-equipped by experience to handle his many new problems. After graduation from West Point Military Academy, he served for thirty years as an officer in the United States Army. He resigned following the end of the world war to engage in business, but returned to government service a few years later as assistant secretary of the U. S. Treasury where he had charge of prohibition enforcement. He resigned from the Treasury last August, since which time he has been president of the Guardian Investment Trust Company of Hartford, Conn., and as receiver, he has been running the New York & Queens County Street Railway for the past four years.

In his remarks at the organization meeting of the Institute General Andrews made clear beyond any doubt the extent to which he expects to take official Washington into his confidence as the policies and plans of the Institute are worked out. The general plan will be to secure preliminary judgment from the appropriate officials before action is taken. This is in view of the realization that the curbing of competition may easily be the subject of attack.

Authorities Consulted

In order to show that the plans of the Institute to correct merchandising practices in the rubber industry are not out of line with the views of official Washington, General Andrews quoted at length from speeches made within recent months by Assistant Attorney-General William Donovan and Commissioner Meyer of the Federal Trade Commission. Both of these officials appear to be convinced that excessive competition is generally harmful and that efforts to correct it along the right lines should be encouraged rather than penalized.

Following the organization meeting the election of the board of directors, General Andrews proceeded to Washington to secure the views of appropriate officials on the proposed articles of incorporation. After these have been found in satisfactory form and formally filed, the first meeting of the directors of the Institute will be held. Preliminary investigations of certain trade practices have already been begun so that no time will be lost in beginning the elimination of unsound methods.

As regards the complexion of trade associations and institutes within American industries, there is very little difference and the only distinction which has apparently marked their activities in the past has been that trade associations have usually been smaller groups whereas institutes have embraced the industry as a whole. Trade associations have also confined their activities largely to cooperative assistance in the dissemination of helpful information and the compilation of statistical data, whereas institutes have been largely for research activities, industrial standardization and the coordination of productive effort. Very often both associations and institutes engage in handling publicity campaigns, conduct policies of trade and public relations, compile statistics and issue periodical reports on the state of the industry. In almost every case where an institute is formed there are also within the same industry a number of associations. Some well-known institutes are in the petroleum, meat packing, iron and steel, and cotton manufacturing industries.

ELECTED DIRECTORS OF THE RUBBER INSTITUTE, INC.

Class I. From companies having annual sales of more than $50,000,000

H. S. Firestone,
Firestone Tire & Rubber Co.
P. W. Litchfield,
Goodyear Tire & Rubber Co.
H. T. Dunn,
Fisk Rubber Company
C. B. Seger,
United States Rubber Co.
J. D. Tew,
B. F. Goodrich Co.

Class II. From companies having annual sales of from $10,000,000 to $50,000,000

A. F. Townsend,
Manhattan Rubber Mfg. Co.
F. C. Hood,
Hood Rubber Company
Wm. O'Neil,
General Tire & Rubber Co.
Samuel Woolner,
Kelly-Springfield Tire Co.
F. A. Seiberling,
Seiberling Rubber Company

Class III. From companies having annual sales of less than $10,000,000

A. B. Cornell,
Hamilton Rubber Company
Thomas Machett,
Hewitt Rubber Company
E. S. Boyer,
American Hard Rubber Co.
C. D. Garretson,
Electric Hose & Rubber Co.
C. S. Dickey,
Corduroy Tire Company

Organization Declaration
of
The Rubber Institute, Inc.

IN meeting the forces of modern economic conditions, the individual rubber products manufacturer has stood alone, even without that knowledge of trade data to which he is legally entitled. He has, therefore, practically been forced to engage in ignorant and often ruthless competition, which has resulted in unsound and uneconomic merchandising trade practices, destructive of stability, leading to unfair discrimination between customers, and denying to individual efficient management the advantages of wholesome competition and an opportunity to do business with an adequate financial return. The industry recognizes its need for that cooperation in wholesome competition which has been brought about in other large industries through the lawful activities of trade institutes.

It is therefore proposed to organize The Rubber Institute, Inc., for the following purposes:

> To promote in the industry a mutual confidence and a high standard of business ethics; to eliminate trade abuses; to promote sound economic business customs and practices; to foster wholesome competition; to provide ultimately for individual efficient business management operating independently an opportunity to do business with an adequate return; and thus generally to promote the service of the industry to the public welfare.

Believing wholeheartedly in the American principle of preserving unimpaired the independence of the individual manufacturer and the maintenance of the principle of wholesome competition between manufacturers, the plan and the future code of trade practices of the proposed Institute are founded upon the following principles:

1. Adherence to law, and particularly to those prohibiting the fixing of prices, the allocation of or discrimination between customers, the allocation of territory, and the control of production in restraint of trade.

2. The avoidance of unfair discrimination between customers. To that end, rubber products should be sold only upon prices and terms made by each member acting independently and immediately thereafter publicly announced. No member would be obligated to any other member or to the Institute to continue the use of such prices or terms for any period, but would reserve the right to change them at will, and would announce any departure from the same immediately that it is made. A manufacturer may charge a higher price for special service and/or for superior quality without making such higher price a part of his announced schedule.

3. These announced prices and terms should be absolutely net, without any form of secret price concession whatever. A price concession in any form whatsoever if employed with one customer is discriminatory unless employed with all customers. If thus uniformly employed it amounts to a general price concession which should frankly take the form of a price reduction. Any possible form of price concession is unethical, except when practiced openly; is discriminatory unless uniformly employed; and in any event is wasteful, unbusinesslike and damaging to wholesome competition.

A code of trade practices for the Institute in keeping with the above principles which will definitely describe certain practices as unfair will be developed in consultation with the Federal Trade Commission as experience, necessity and the judgment of the members of the Institute may determine.

We, the undersigned, hereby associate ourselves as members of The Rubber Institute, Inc., and hereby severally subscribe to the above; subject, however, to the same being submitted to the Department of Justice of the United States of America and the Federal Trade Commission, and no objection being raised to any part of the same by either department.

Frederic C. Hood,
Hood Rubber Company.
Samuel Woolner, Jr.,
Kelly-Springfiled Tire Co.
H. S. Firestone,
Firestone Tire & Rubber Co.
J. D. Tew,
B. F. Goodrich Co.
H. L. McClaren,
Ajax Rubber Co., Inc.
Wm. F. Pfeiffer,
Miller Rubber Co.
E. B. Germain,
Dunlop Tire & Rubber Co.
H. T. Dunn,
Fisk Rubber Co.
F. A. Seiberling,
Seiberling Rubber Co.
P. W. Litchfield,
Goodyear Tire & Rubber Co.
C. B. Seger,
United States Rubber Co.
J. B. Gabeline,
Standard Four Tire Co.
F. H. Comey,
Falls Rubber Co.
N. Lincoln Greene.
Clifton Mfg. Company.

C. D. Garretson,
Electric Hose & Rubber Co.
S. S. Miller,
Mohawk Rubber Co.
Louis Alexander,
Industrial Rubber Corp.
Edwin S. Boyer,
American Hard Rubber Co.
P. G. Himmebright,
Monarch Rubber Co.
J. Schwab,
Salem Rubber Co.
A. F. Townsend,
Manhattan Rubber Mfg. Co.
F. B. Williams, Jr.,
Whitehead Bros. Rubber Co.
C. S. Dickey,
Corduroy Tire Co.
L. J. Schott,
Northern Rubber Co.
Thomas Morrison, Jr.,
Murray Rubber Co.
A. B. Cornell,
Hamilton Rubber Mfg. Co.
A. L. Schoff,
Overman Cushion Tire Co.
J. H. Lambert,
Acme Rubber Mfg. Co.

H. R. Young,
Combination Rubber Mfg. Co.
J. H. Michelin,
Michelin Tire Co.
A. A. Garthwaite,
Lee Rubber & Tire Corp.
L. J. Plumb,
U. S. Rubber Reclaiming Co.
A. H. Canfield,
The H. O. Canfield Co.
Thomas Machett,
Hewitt Rubber Corp.
Otto Basten,
Sterling Tire Corp.
Wm. O'Neil,
General Tire & Rubber Co.
J. M. Whitehead,
Norwalk Tire & Rubber Co.
W. C. Hoover,
Cord Tire Corporation.
C. E. Pumphrey,
Fidelity Tire & Rubber Co.
S. T. Campbell,
Aetna Rubber Co.
J. M. Alderfer,
India Tire & Rubber Co.
Eberhard Faber,
Eberhard Faber Rubber Co.

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Unsound Merchandising In The Rubber Industry

Responsibility for Profitless Prosperity Rests on Both Buyer and Seller—The Latter Can Remedy the Situation by Learning to Refuse Orders Which Offer No Profit or Mean a Loss

LIKE a fresh sea breeze bringing relief on a stifling summer day, comes the news that the rubber industry, through the newly-organized Rubber Institute, is to tackle the most vital problem in the entire industry—the elimination of unsound merchandising. Indeed, this problem is not only one for rubber but for all the national industries to solve, and some constructive work has already been done upon it. The refreshing thing about the Institute's program is that it is asking not for secret agreements but for open and above-board co-operation. It means that some rubber products sales managers will learn that it is no disgrace to lose an order which will only bring a loss to the company.

It is inevitable in a condition like we have at present that the blame should be placed on the so-called "hard-boiled" buyer who by ruthless tactics forces prices below the cost of production. But some of the purchasing agents in various industries finally became aroused by what they considered undeserved criticism, and the result was a round table conference in New York last month where the sales managers, presidents, advertising managers, and purchasing agents sat round the table and talked things over.

The common answer to the question, "What is the matter with business?" is that prices are too low and profits too meager, a condition often attributed to unscrupulous purchasing agents who force prices down by methods that would shame a horse trader of the old school. But James H. Collins in a recent issue of *Printer's Ink* picks up the cudgel for the buyer and blames the seller for his own troubles. Mr. Collins says the present situation is one of nine-to-ten ratio—nine orders for ten sellers. The concern that adapts its sales policies and methods to this situation has little to fear. "No matter how bad business may be, there are always nine orders for the ten sellers," he writes. The real trouble with business today, in his opinion, is that to acquire the tenth order, and thereby make up a full quota, concerns try to force sales by unsound and extravagant methods.

Methods Used to Force Sales

Among such methods, Mr. Collins lists high pressure selling, tactics designed to browbeat the buyer into signing on the dotted line, price-cutting disguised under a hundred forms of camouflage, super-advertising with words and claims based on half-truths, the arbitrary exercise of power that goes with big business, and the condemnation of purchasing agents because of conditions which are wholly economic.

"Sellers put pressure on the purchasing end of the business. They blame the buyer for not having ten orders instead of nine and denounce him for trying to find new price levels. The very salesmen who call upon him are urging their purchasing agent to lower the prices of their products."

At the New York conference on May 2 several important points were brought out. E. F. DuBrul, manager of the National Machine Tool Builders' Association, cited a number of existing evils, including price cutting, under the influence of intense competition, and the demands of buyers for free engineering service. While deploring the methods used by some purchasing agents to exact unwarranted price concessions, he affirmed that the existing situation was primarily the result of weak selling effort on the part of manufacturers. The remedy, he declared, might be found in trade practice conferences, under the supervision of the Federal Trade Commission, which would establish as unfair and possibly unlawful many of the expedients used by "cut price" manufacturers to secure business.

W. W. Nichols of the Allis-Chalmers Company presented another viewpoint to the conference by asserting that it is the duty of a purchasing agent to be informed as to the profits or losses of his suppliers. The welfare of industry is the welfare of the nation, he stated, and to insure general prosperity manufacturers in all lines must be allowed a margin of profit sufficient to maintain and develop their business. The solution he proposed for present conditions is for manufacturers to maintain firm prices, on the one hand, and for purchasing agents, on the other hand, to restrain competition within reasonable limits by reducing the number of proposals on goods for which they are in the market.

Agreement Reached at Conference

At the close of the conference, which occupied the entire day, tacit agreement had been reached on several points. First, that "profitless prosperity" is a natural reflection of the existing ratio of supply to demand, establishing a buyer's market. Second, that while unscrupulous methods are followed by some purchasing agents, they are not typical, and that a much greater contributing factor to the present situation is found in inefficient and spineless selling. Third, that co-operation and understanding between buyers and sellers are vital to the success of their respective industries. Fourth, that no single panacea exists for the present conditions, but that it is highly beneficial to encourage frank and unrestrained discussion of common problems by sales executives and purchasing agents.

It is natural that the sellers' side of the present situation should receive more attention than the buyers'. Until a few years ago purchasing agents as a whole were quite inaccessible, but now a new school of buyers has come into existence. They are beginning to make themselves known and heard through the trade press, through their national association with its 5,000 members, and through fifty-six local associations, three of which have buyers of rubber companies as their presidents. They meet the seller on equal ground and talk things over to their mutual advantage.

W. L. Chandler, former secretary of the National Association of Purchasing Agents, cited instances of the new

attitude in a recent interview in the New York *Times:*

" . . . in the long run it is poor business to be a party to a transaction where either side is going to lose money. Losses on an individual transaction may not be large, but in the aggregate they constitute a definite and serious drain for the seller. Experienced buyers know that the goodwill of the vendor is an important factor and that it cannot be had unless a legitimate profit is allowed.

"There are, however, many other angles to the buying of merchandise that need to be considered in this general question. It is obvious that if buying were to be confined to paying the 'first price' offered, there would be no need of a purchasing agent. It may be said that the purchasing agent has not devoted enough consideration to the problem of the seller, apparently in the belief that the latter is well able to take care of himself.

"The purchasing agent is an officer of the corporation and as such views a purchase from general market conditions rather than a single transaction. He has to watch the market to be sure he is not overpaying and that concerns which compete with his own are not able to buy more cheaply. He is naturally trying to get a little better quality at a price which is a little lower. And his success in this endeavor plays a large part in the success of the entire corporation."

Raw Material Is Large Item

The truth of this last statement can be realized by applying it to the buying of materials for rubber manufacturing. From 25 to 40 per cent of the wholesale selling price of rubber products is the raw material bill. It is the largest single item in the cost of merchandise.

"The buyer frequently has no reliable or entirely accurate information," continues Mr. Chandler, "as to what is the bottom price on certain merchandise in which he is interested. Accordingly, in dealing with certain types of salesmen, the job of the purchasing agent is to smoke out the 'confidential stuff.' In every purchase, as I have said, he is guided by the relation of the price he is asked to pay to that paid or likely to be paid by his competitor.

"A consideration that some sales managers frequently overlook may be mentioned here. If a manufacturer finds himself with a big inventory and is forced to make concessions to get orders, no buyer is going to pay more than the prevailing market conditions warrant. A manufacturer, for example, may be loaded up with pig iron, and if the market on pig iron drops he cannot expect special consideration from those to whom he sells. This manufacturer speculated in covering his raw material requirements in advance, and if he did not guage the action of the market correctly that is his error.

"These considerations deal solely with market conditions and do not parallel the seeking of the 'last drop of blood' of which sellers can rightly complain. It must be remembered that any vendor supplying material at a financial loss, because of the hard bargain-driving tactics pursued by buyers, for his own protection is going to exhaust every means of recouping that loss.

"Logically he will try to do it at the expense of the party who occasioned the loss. Many times in such transactions the quality is apt to be shaded, although the manufacturer may stick within the letter of the bargain. There is every indication of a greater degree of co-operation and mutual understanding between buyers and sellers. In no way can this be better fostered than by the realization that a fair profit for both is essential."

In rubber products particularly, the matter of quality is one on which the buyer may be easily fooled. Very few rubber products are sold on specification, with the result that a cut price may mean cut quality even though a sample is submitted. Of course, in many products, quality is known by brand name and the element of brand preference enters into the transactions which means that less stress will be laid on price.

Some of the recommendations which were brought out in the New York conference would not work out in many instances. For example, one carries the suggestion that the purchasing agent restrict the number of bidders when in the market for a contract. Not long ago, a buyer for a rubber company did this very thing in asking for quotations on 5,000 units of a commodity from two suppliers whose product was especially desirable and of high grade. Supplier A was 5 per cent lower than supplier B and got the order. A month later the same buyer went to the same two suppliers for the same quantity. Supplier A volunteered the information that a price war had been on in that particular commodity but it was now settled by mutual agreement and quoted 5% higher than his original price. Supplier B stated that he needed the business and was going to make sure not to lose it this time and quoted 10% lower than the original price. Thus the second order went to supplier B at a lower figure than the first order even though the price of raw material had advanced. Certainly this situation was not caused by the buyer who indulged in no bargaining tactics whatever.

A month later Supplier C, who had not been asked to quote, happened to call and as a matter of courtesy was asked to figure on the same number of units. The resulting price was much higher than either of the other two purchases although a laboratory test showed the quality to be the same. The vendor stated that this price afforded him a bare profit. When no business was forthcoming he started to cut his price, doing so twice, but did not reach the figure of the other two. Finally, the purchasing agent told him that if he was below his cost he must forget it, as evidently the other suppliers had lower costs than he had.

Knowledge of Seller's Costs

The suggestion that buyers should know the sellers' costs is fraught with difficulties. Costs are by no means fixed, and all are susceptible to reduction. The buyer from his seat of vantage can see many of the wastes of distribution. When it comes right down to the fine point, sellers are not going to be willing to furnish costs to prospective buyers. What the sellers need is a little more backbone to stand their ground on what they figure a fair profit, and courage to lose an order when taking it only means a loss.

Thus in truth, it can be said, that part of the responsibility for this unsound merchandising, which is the correct name for selling goods at no profit or at a loss, is the buyers' and part the sellers'. The best way to eliminate the practice is for the manufacturers to get together in each industry as they are doing in the Rubber Institute, and as they have done in the Textile Institute, and for the buyers and sellers to sit round the table to iron things out.

Grasselerager-A—New Antioxidant

A NEW antioxidant with distinct accelerating properties has been announced by the Grasselli Chemical Company under the name Grasselerager-A. This material is a liquid of amber color with a specific gravity of 1.005 weighing 8.2 lbs. per gallon.

It is not volatile and does not have an unpleasant odor, is soluble in rubber, has practically no effect on colors and does not bloom on unvulcanized rubber. As for its accelerating power, its manufacturers state that one part Grasselerager-A equals four-tenths part DPG. Some adjustment in formula is recommended in moderately accelerated stocks but for some purposes sufficient acceleration is obtained from the antioxidant alone.

Expected Production of Native Rubber in the D. E. I.

Higher Rubber Prices Since 1923, Particularly in 1925, Have Stimulated The Planting of Native Rubber to Such an Extent That the Output Will Probably Double Within the Next Few Years

(The following analysis of the probable course of native rubber production in the Dutch East Indies during the next few years has been prepared by A. Luytjes, a forest engineer of the Dutch Colonial Government who is stationed in Java. His conclusions of chief interest are that the present area under native rubber in the D. E. I. is from 1,235,000 to 1,480,000 acres and that the production of dry rubber may be expected to reach 150,000 to 175,000 tons within the next five years with an increase to 200,000 tons thereafter. This material was received from the Division of Commerce, Buitenzorg, Java, which issued Mr. Luytjes' conclusions as a mimeographed news bulletin.)

BETWEEN 1900 and 1910, when the cultivation of native rubber was still in its prime, the native population in the Dutch East Indies planted a few rubber trees here and there but naturally this cultivation was of little significance. However, the favorable rubber prices from 1910 up to and including 1912 did not fail to draw attention to this product with the result that during that period well-to-do natives in several parts of the archipelago started laying out rubber gardens on an extensive scale, providing themselves with Malacca seeds and seedlings. However, this enthusiasm subsided noticeably as prices began to crumble in 1913.

Towards the end of the year 1915 prices improved, the gardens which had been laid out between 1910 and 1913 started producing, yielding favorable returns which awakened a general interest for this cultivation. Besides, seeds and seedlings could now be obtained in a much easier manner from existing gardens. Another factor which was to the advantage of native rubber cultivation was the discovery that laying out of new gardens combined with the usual system of planting on cleared forest patches demanded very little capital and very little labor.

Consequently, from 1916 onwards rubber planting has developed into a regular native cultivation which extended rapidly, especially in Sumatra and Borneo. Owing to the near vicinity of these islands to the Malacca peninsula, the population there in no time adopted the feverish haste in planting rubber trees with which their neighbors were possessed.

The slump which prevailed in 1920 inevitably had a detrimental effect on native rubber cultivation. The product could scarcely fetch a price, with the result that the discomforted population ceased altogether adding new trees to their plantations. Likewise, during 1921 and 1922 the gardens underwent hardly any further extension.

However, the recovery of the rubber market toward the end of 1922 caused the people to regain confidence in rubber. During the season 1922-1923 the area was again extended, while the following year this extension was continued on a still more important scale. Owing to the exorbitant prices which then prevailed, the population got possessed by a regular mania for planting rubber; every part of cleared land situated in rubber districts was transformed into a rubber garden, with the result that during the last few years the cultivation has undergone a considerable extension. Whereas during the slump the planted area covered some 160,000 hectares (395,000 acres), the actual area now planted with native rubber will measure no less than 500,000 to 600,000 hectares (1,235,000 to 1,482,000 acres).

Typical Native Rubber Estate in Dutch Territory

These figures are the result of a rough calculation, working from the total production of rubber to the probable number of trees and thence to the estimated area. The average production per tree is four grams of dry rubber per day which is equal to about one kilogram (2.2 lbs.) per year, the trees not being tapped on market or rainy days. The total production of native rubber in the Netherlands East Indies is about 95,000 tons yearly, which indicates a stand of 95,000,000 trees. However, owing to the closely planted native gardens which average 800 trees per hectare (324 per acre), about 25 per cent result in failures so that no more than 600 trees per hectare (243 per acre) are left. This is the basis for calculating the present producing area at approximately 160,000 hectares (395,000 acres).

From a personal investigation and numerous communications, it has been inferred that the planted area of native rubber is three to four times more extensive than the producing area, from which the conclusion should be drawn that the total area now covered by native rubber actually includes some 500,000 to 600,000 hectares (1,235,000 to 1,482,000 acres).

When studying the general trend of exports in con-

junction with the extension of planted areas, the increased exports, as a direct result of increased cultivation, constitute a striking feature. A native rubber garden is tapped after 4 or 5 years, consequently the gardens laid out between 1916 and 1920 started producing between the middle of the year 1920 and 1924. When taking into account that during the years 1920 and 1921, owing to low rubber quotations, tapping was done on a very moderate scale and that the production of thickly planted rubber gardens continues to increase for 7 or 8 years, the narrow relation existing between producing areas and rubber exports is evident. This direct connection is likewise apparent when considering that since the year 1925 the exports of rubber have ceased to increase to any considerable degree, which was a direct result of the circumstance that rubber gardens were not extended in 1920-1922.

Production Expected to Increase in 1928

In the next few years the gardens which have been laid out from the middle of the year 1923 onward will start producing. Consequently, the production is expected to increase considerably after 1928, even to such an extent as to render the producing area under native rubber within 4 or 5 years 3 to 4 times larger than it is in its present state. However, we should not make the error of supposing that exports will increase in a similar way, owing to factors such as the limited number of laborers available and the influence of market quotations.

In Palembang the number of tappers is still sufficient to tap the entire productive area every day. In Djambi a shortage of labor keeps the trees from being tapped every day so that tapping at irregular intervals is applied. The result is that the Djambi tapper collects more rubber per day and gets a larger amount as his share. Hence, a tapper in Djambi will be able to continue working at a lower price level. With regard to labor recruitment, conditions on the west coast of Sumatra, Tapanoeli and the whole of Borneo are similar to Palembang while those prevailing in Indragiri and the southern part of the east coast of Sumatra are about the same as in Djambi.

In the provinces where daily tapping is applied, owing to the increase in the number of trees which have reached sufficient maturity to allow this operation, the production will first increase until the limit of the labor market has been reached. When the productive area will have increased still further, tapping at irregular intervals will be applied, with the result that with the same number of hands a considerably higher yield may be obtained. According to this system the production per coolie as well as his daily wage will increase, no doubt adding to the attractiveness of the work and facilitating the recruiting of labor. In those provinces where irregular tapping is generally applied, laborers will show a tendency to pick out the most productive gardens, thus further increasing production in those districts.

Production May Reach 175,000 Tons

Taking into account the above considerations, it is fairly certain, if quotations maintain the same level, that production of native rubber will increase considerably within the next five years. It is even very likely that the annual production during this period will reach some 150,000 to 175,000 tons of dry rubber, while it is by no means unlikely that beyond that period the yield will reach even as much as 200,000 tons.

The influence exercised by rubber quotations on the production of native rubber is much more difficult to establish. Generally speaking, labor will feel attracted towards a high price, while a quotation which would yield unremunerative returns would at once result in lesser yields.

However, at what level the coolie would finally decide to abandon his work can not be made out here, this level being dependent on the condition of the money market in the interior as well as on the quantity produced per tapper. The greater the abundance of money, the higher the minimum price level will be, while in the case of a tight money market, this level would drop accordingly. In 1922 in the midst of the slump, tapping was continued unrelentingly at a standard price of 7 pence (14 cents). On the other hand, during the early half of the year 1926, after the plentiful money market in 1925, work was temporarily suspended at a level of 1 shilling, 8 pence (40 cents).

Native rubber is actually entering upon a new phase, whereby the introduction of periodical tapping will greatly contribute to improving conditions prevailing in this line of agriculture.

It will be eminently desirable to keep a watchful eye on this important source of production and to avoid dealing with this subject as if it were a matter of but secondary importance.

The Life of Balloon Inner Tubes

LONGER life of inner tubes in low-pressure tires is said to be indicated by the fact that automobile tire casing sales have steadily increased during the last three years while sales of inner tubes have remained practically stationary. This observation is made in a statement June 4 by the Automotive Division of the Department of Commerce. The full text follows:

While sales of automobile tire casings have steadily increased, those of inner tubes have remained practically stationary for the past three years. According to figures compiled in the Automotive Division, retail sales of casings for the year ended April 1 last amounted to 45,929,000, an increase of 8,849,000 over the figure for the corresponding period of 1927. Similar figures for inner tubes sales show that sales for the year ended April 1 were 55,251,000 as compared with 55,270,000 for the earlier period.

In the year ended April 1, 1926, tire dealers sold 1.49 inner tubes on the average with each casing, in the next year 1.33 inner tubes per casing, and in the year just ended 1.20 inner tubes per casing. Aside from the fact that repairing of inner tubes has been more common during the past two years than in 1925 and previously, it appears that inner tubes last longer in low pressure tires.

10 YEARS AGO

Items Reprinted from June 10, 1918, issue of THE RUBBER AGE

THE Rubber Association warns rubber manufacturers and importers of the importance of filing certificates of allocation, as granted by the War Trade Board. Without such certificates it is impossible to obtain licenses to have rubber shipped from overseas . . . War Trade Board advances the fixed valuation of standard smoked sheets to 61 cents . . . Miller Rubber Company expands its organization in the southwest through a chain of new distributors and branch offices . . . E. H. Clapp Rubber Company celebrates its fiftieth anniversary . . . Hugh Miller is appointed traffic manager of U. S. Rubber Company . . . Trenton Rubber manufacturers donate cloth to local Red Cross . . . Goodyear begins the construction of a balloon testing building at a cost of $100,000 . . . Akron's drive to fill her War Chest Fund nets $2,500,000 . . . Business in the rubber manufacturing trade continues in good volume but great difficulties are being experienced with the labor shortage and the scarcity of certain raw materials . . . Scrap and reclaimed rubbers are enjoying an increasing demand.

Color Reactions of Rubber

Ability to Control the Course of Reactions by Simple Color Tests is of High Value to Rubber Investigator

By H. PAULY*

WHILE the organic chemist, working with comparatively small molecules, can proceed directly by exact methods to an explanation of the structure of compounds, and therefore considers color reactions of minor importance, these reactions often afford a convenient tool for the chemist who is investigating substances of very high molecular weight, which occur for the most part in nature. They offer a quick means of obtaining a preliminary idea of the presence of certain chemical groups, or of distinguishing between substances which can be identified physically only with difficulty. One would rob protein chemistry of indispensable methods were one to remove its color reactions. In the examination of natural substances they are a guide in the immense field of qualitative tests.

Likewise, in research on rubber, the question to what extent it is to be considered a homogeneous substance greatly restricts the investigator in his methods of purification. Therefore, it would be of value to him to be able to control the course of his reactions through simple color tests. Such means have been unknown in rubber chemistry.

Rubber gives almost all the color reactions of the sterols, except where its insolubility interferes. Thus, the reaction of Hesse[1], (Solution in chloroform, treatment with an equal volume of concentrated sulfuric acid; yellowish red flakes); that of Liebermann[2] (Treatment with acetic anhydride, addition of concentrated sulfuric acid drop by drop; color play, ending with dark violet blue); that of Burchard[3] (Solution in 10cc[4] chloroform, addition of about ten drops of acetic anhydride and concentrated sulfuric acid; Bordeaux red to reddish violet color, with or without a color change); that of Tschugaeff[5] (Warming in acetic acid solution with acetyl chloride and zinc chloride; cosin-like color); that of Tschugaeff-Golodetz[6] (Solution in trichloracetic acid, finally with the addition of a trace of formaldehyde; a deep violet color, becoming more intense); that of Kahlenberg[7] (Treatment of a chloroform solution with arsenic trichloride; reddish violet color), etc.

Wild Rubbers React Same as Plantation

What was true of the rubber under investigation is also true of a number of natural rubbers, "wild" as well as "plantation;" also synthetic rubber, fresh Castilloa latex[8] and latex from different varieties of Ficus, which I was able to obtain from the local botanical gardens. But it was of special value to me to be able to make experiments with rubber of the highest chemical purity thus far obtained, which I owe to the kindness of Prof. Pummerer of Erlagen.

All these samples gave the color reactions mentioned, so that there is no doubt—particularly with regard to their positive results in the case of synthetic rubber—that the colors are to be ascribed to pure rubber, and not to some by-product or decomposition product.

Without going into detail, it may be first of all stressed that the color tests are visible only with very light samples; with dark samples they are for the most part recognizable only in very strong sunlight. Among the reactions cited, two claim special consideration:

1. That of Burchard: $CHCl_3$-solution, addition of $(CH_3CO)_2O+H_2SO_4$.
2. That of Tschugaeff-Golodetz: CCl_3COOH $(+CH_2O)$

1. The Burchard reaction has shown itself extraordinarily sensitive to the quality and purity of the rubber, so that one can almost say that each kind of rubber shows a characteristic color. The best natural rubber, as well as the best synthetic rubber (polymerised by heat) gives the reaction most beautifully and clearly. On the other hand, the varieties purified by Pummerer by treatment with alkali differ from those not thus purified in that they give a Bordeaux red color and precipitates which are stable for a relatively long time, with no subsequent color changes. It may be that the color change is the result of the oxidation of rubber or of oxidation products of rubber prepared in the ordinary manner, unprotected from the air. I draw this conclusion from the fact that amyrins, which are often present in natural rubber, give, as does "Pummerer-rubber," a purple color with acetic anhydride and sulfuric acid, without a color change.[9] However, the addition of a particle of benzoyl peroxide is followed by a beautiful transition through deep violet and blue to green. To be sure, in the case of "Pummerer-rubber," the addition of benzoyl peroxide does not bring about such a change—apparently benzoyl peroxide does not oxidize rubber immediately—which merely signifies that the types of rubber that give the color change already contain resinous oxidation products.

Sodium Rubber Reacts Differently

It is interesting that, inasmuch as sodium-rubber fails completely to behave as "normal" rubber in the Burchard-Liebermann reaction, the brownish yellow color which appears cannot be regarded as a typical reaction. Likewise in the case of a few low grade natural rubbers similar unexplanable phenomena appear.

2. From a quite different point of view, the Tschugaeff-Golodetz reaction is worthy of note, because in this case it is possible to explain the nature of this color. The trichloroacetic acid which gives the violet color in this case is, to be sure, a rather strong organic acid, but is not to be compared with concentrated sulfuric acid and similar strong inorganic substances which are utilized in the other reactions. The color is due to the acid nature of the trichloroacetic acid (cf. Note 6); it disappears on diluting with water, and the rubber which is precipitated appears completely unchanged. What is more natural than to think of a halochrome? Reasoning by analogy, the latter would depend on the unsaturated character of the rubber. Hydrogenated rubber, which, unfortunately, is not at my disposal, would not necessarily give the color, if it no longer contained unsaturated bonds.

Such color reactions have never been noticed with acyclic unsaturated hydrocarbons, and accordingly sterol tests are not given by sirupy isoprene polymerized in the cold and isoprene dicarboxylic acid ester[10] polymerized by light, which, I think, are acyclic. On the other hand, one often finds in the literature the remark that diolefinic hydrocyclic hydrocarbons give colors with acetic acid or acetic anhydride with or without concentrated sulfuric acid (Wallach reaction). Moreover, sterols, amyrins and resins which give color tests are considered to have a cyclic structure. Presumably unsaturated polycyclic alcohols which also give color reactions are changed under the dehydrating effect of the reagent to diolefins. Therefore, does not this property of rubber argue in favor of a cyclic structure in the sense of the old Harries' theory?

Another characteristic, which is concerned not so much with the cyclic structure as with the unsaturated nature of rubber, is its ability, also disclosed by Pummerer and Pahl[11], of adding of tetranitromethane. In this connection, I may mention that I have made the similar observation that rubber also unites with stannic chloride, whereupon it separates out from chloroform solution as a

*Translated from the Journal für Praktische Chemie, Vol. 118, pp. 48-52 (1928), by J. P. Fahy.

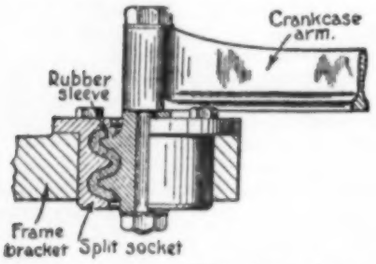
saffron-yellow precipitate. Further investigation of this substance must be discontinued for other reasons.

In conclusion, it may be mentioned that gutta percha gives colorations similar to those given by rubber.

1. *Ann.* **192**, 178 (1878); **211**, 283 (1882).
2. *Ber.* **18**, 1804 (1885).
3. *Chem. Zentr.*, **1890**, I, 25.
4. Presumably half the old quantity to restrain spontaneous heating.
5. *Chem. Ztg.*, **1900**, I, 472.
6. *Chem. Ztg.*, **1908**, 160. Rubber dissolves in fused trichloroacetic acid (m. p. 55°). This is the more striking, as it is not noticeably dissolved by acetic acid, or mono- or dichloroacetic acid That the $-CCl_3$ group, as in chloroform, is responsible, follows from the fact that other compounds with this group show a tendency to dissolve or disperse rubber. This is true of trichloroethyl alcohol, and especially anhydrous chloral. However, trichloroacetic acid alone of all these substances gives the color, which, according to Golodetz, is quickly developed by traces of formaldehyde.
7. *Chem. Zentr.*, **1922**, II, 382.
8. Castilloa-latex behaves irregularly in giving with Burchard's reagent an intense green fluorescence, probably because of the presence of an impurity (cf. Weber, *Ber.* **36**, 3108, 1903).
9. Ultée, *Chem. Zentr.*, **1912**, II, 1469; **1916**, I, 1251. It is possible to distinguish amyrins from rubber by the Burchard reaction, which is given by the former, but hardly or not at all by the latter. Vice versa, in the Liebermann reaction, amyrins immediately give an intense purple color, while rubber, because of its insolubility in acetic anhydride, gives a color only very gradually and hardly noticeably. Likewise, the Hesse test makes a distinction possible. If one pours the yellowish red solution obtained with amyrins into a shallow porcelain vessel, violet red rings appear immediately. With rubber this is not the case.
10. Pauly and Will, *Ann.* **416**, 9 (1916).
11. *Ber.* **60**, 2159 (1927).

Rubber in Flexible Mountings

A NEW type of flexible mounting as applied to automobile engines has been developed in England by Riley (Coventry, Ltd.), and Harry Rush, the object being to produce a mounting which will prevent vibration from being transmitted from the engine to the chassis frame. The feature of the new invention is the use of a rubber sleeve.



As shown by the accompanying illustration, the arm carrying the crankcase is bolted to a central member with circumferential ribs engaging a rubber sleeve fitting in a split socket. After assembly over the sleeve, this socket is dropped into a circular recess in a bracket fitted to the chassis frame and bolted.

U. S. to Invite Highway Congress

AT the invitation of the United States Government the leading highway engineers and others interested in highway developments will meet in Washington in 1930 to attend the Sixth International Association of Road Conferences.

Fifty nations and five continents are expected to send delegates to the meeting, which will be historic in that it will mark the first time the International Road Conference has assembled in the Western Hemisphere.

The formal invitation will be transmitted by Secretary of State Kellogg, by direction of President Coolidge, to the Permanent International Association of Road Congresses, the official name of the organization. The association had previously voted to accept the invitation if extended. At the Fifth International Conference at Milan in 1926 the delegates from the United States tentatively advanced the project of bringing the next conference to the United States and the request for the invitation was formally made of President Coolidge by Roy D. Chapin, United States delegate to the International Commission of the Conference at Paris last year and president of the N. A. C. C.

Other organizations which hastened to go on record as favoring the proposed conference included the Rubber Association of America.

Carbon Black Production in 1927

THE production of carbon black within the United States reached a new record during 1927 when a total of 198,429,000 pounds was recorded, according to a report of the United States Bureau of Mines. This output represents an increase of 17,853,000 or 9.9 per cent over the production during 1926. In point of value the production during 1927 was worth at the manufacturing plants $10,955,000. Total sales during the year amounted to 223,430,000 pounds, an increase from the previous year of 33.4 per cent. Of this amount 168,999,000 pounds went into the hands of domestic users while the balance was for export.

The western movement in the location of plants was evidenced in the growth of the importance of Texas as a producing state, where new plants recently erected in the Panhandle district more than compensate for the dismantling of plants in West Virginia.

Although no figures are available covering the domestic distribution of carbon black as between the various industries, it is probable that the rubber manufacturing industry is the prime user and it is estimated that fully half of the domestic consumption can be credited to that industry.

The following comparative statistics are interesting as showing the increase in the industry.

CARBON BLACK STATISTICS

	1926	1927
Producers reporting	33	33
Number of plants	62	61
Production, pounds—		
Louisiana	130,377,000	124,188,000
Texas	36,328,000	56,396,000
Wyoming	*	6,294,000
Kentucky	6,310,000	5,669,000
West Virginia	3,804,000	2,796,000
Other States	3,757,000	3,086,000
Totals	180,578,000	198,429,000
Produced by—		
Channel process, pounds	152,300,000	167,357,000
Other processes, pounds	28,276,000	31,072,000
Stocks held by producers Dec. 31, pounds	108,378,000	82,831,000
Losses, pounds	717,000	546,000
Sales, pounds	167,504,000	223,430,000
Domestic	128,294,000	168,999,000
Export	39,210,000	54,431,000
Value (at plant) of carbon black produced—		
Total, dollars	9,939,000	10,955,000
Average per pound, cents	5.5	5.5
Estimated quantity of natural gas used (M cubic feet)	130,321,000	144,087,000
Average yield per M cubic feet, pounds	1.4	1.4

*Not available.

Airplane Production Jumps

ACCORDING to recent reports of the Department of Commerce giving the census of manufacturers engaged in the production of airplanes, a total of 1,857 airplanes valued at $12,024,085 and 105 seaplanes valued at $2,226,520 were manufactured during 1927. These figures show an increase of 65.4 per cent in number and 60.6 per cent in value as compared with similar production in 1926. A comparison between 1925 and 1927 shows a gain of 148.7 per cent in number and 113.5 per cent in value. Of the 61 manufacturing establishments reporting for 1927, a total of 15 were located in New York state, 9 in California, 9 in Michigan.

British Motor Trade

THE British motor trade is steadily expanding. In 1913 the total number of vehicles manufactured was 44,000. In 1926 the number had grown to 120,000 and last year it reached 209,000 vehicles. The latest British budget, which would put a new gasoline tax of eight cents per gallon on British motorists in addition to the high horsepower taxes, is held likely to retard the growth of automobile registrations in the future.

The Rubber Industry of Sweden

Swedish Rubber Factories Are Best Known for Rubber Footwear, the Output of Which Has Increased Greatly—Not Many Tires Made—Three Large Footwear Companies Have Amalgamated—High Import Duties

THE Swedish rubber manufacturing business today is a remarkable example of cooperative effort in industry. After many years of negotiations looking towards an amalgamation of the larger rubber factories in order to affect economies in operation, eliminate much of the unnecessary competition within the local industry and make for simplification in administration, plans were completed late in 1927 by which three of the most important rubber footwear concerns were merged. The companies involved were the Helsingborgs Gummifabriks Aktiebolaget, at Helsingborg, the Ryska Gummifabriks Aktiebolaget, at Malmo, and the Skandinaviska Gummi Aktiebolaget, at Viskafors. The new company is known as the Forenade Gummifabriks Atgiebolaget and has a reported capital of $5,735,200. At the same time the other important footwear factory, the Svenska Gummifabriks Aktiebolaget, at Gislaved, was purchased by the Kooperativa Forbundet, the large cooperative union of Sweden. As a result of these two combines, the market has greatly improved, production has increased and the industry has grown along more healthy lines.

In addition to the four manufacturing firms mentioned above the Swedish industry also includes the Trelleborgs Gummifabriks A/B, at Trelleborg (which is closely allied with the Helsingborgs Gummifabriks A/B and which produces mainly rubber tires and mechanical goods), and the Upsala Gummifabriks A/B, at Ulvsunda, which also produces tires and mechanical lines.

The last mentioned company was established in 1917, but all the other companies were in existence before the world war. The rubber industry in Sweden was actually started as early as 1870, but did not become an important factor in the nation's industrial development until 1890 when five of the six larger factories now in operation were established.

Growth of Industry Has Been Steady

The rubber manufacturing industry is not large and does not produce sufficient quantities of rubber goods to satisfy the local market, but its growth has been steady and production is increasing yearly. The output in 1926 was approximately 230 per cent of the 1913 total while during the same period the number of workers has increased by 135 per cent.

The rigorous winters and difficulties of rural transportation in Sweden make for an excellent market in rubber footwear. On the other hand the new program of road development is creating an increasing market for tire equipment. The local manufacture of tires is far less, however, than the yearly requirements and consequently imports of casings and tubes are still an important factor in the trade of the country. In fact, in every item of rubber manufactured goods, the local production is not commensurate with the supply, although the country is practically independent in the matter of rubber footwear.

The largest item of manufacture in rubber goods is rubber footwear. Production of footwear now closely approximates the national demand as can be noted in the steady decline in importations of this class and in the fact that Sweden while consuming 85 per cent of its rubber footwear output in 1926 is now able to export to advantage the remaining 15 per cent.

Map Showing Location of Principal Manufacturing Companies in the Swedish Rubber Industry.

As regards the production of tires the chief manufacturers are, as before mentioned, the Trelleborg and Upsala companies. In addition, the Nordiska Overmanring A/B, at Stockholm, produces solid tires. Exclusive of original equipment tires, the consumption in tires in Sweden during 1926 was estimated at approximately 120,000. The two local manufacturers, however, supplied only approximately 7,000 of these replacements. The total number of tires produced is not available.

The Trelleborg and Upsala companies are also the chief manufacturers of rubber belting and mechanical goods, but the Svenska and Skandinavika companies also are minor factors in this field. Rubber balls and other soft rubber goods are manufactured by the Helsingborgs company. Surgical rubber goods are produced by the Skandinaviska company and by the well-known Stille-Werner Company at Stockholm. Waterproof clothing and rubber gloves are made by the Trelleborgs company and also by the Norrkopings Regnkladers och Presenningsfabrik A/B, at Norrkoping. Rubber flooring is manufactured by the Skandinaviska, Trelleborgs and Svenska companies.

Local products are enjoying a decided preference, especially in footwear, where the Swedish taste is very conservative. They prefer to buy the "stiff-backed" galoshes after the style produced by the Russian factories before the world war and as a rule do not like the tight-fitting American rubbers. The footwear industry is highly protected by tariff duties and as a result the manufacturers have enjoyed a good margin of profit.

The following table shows the steady growth of the

Swedish rubber industry during the last few years and particularly emphasizes the advance made in rubber footwear. The slight decline in 1926 in value of goods produced is more largely due to low unit prices than to a lower production in unit volume. Figures for 1927 are not yet available, but reports indicate that they will show a substantial increase over 1926. The par value of the Swedish crown is 26.8 American cents.

THE SWEDISH RUBBER MANUFACTURING INDUSTRY

Year	No. of Factories	No. of Workers	Rubber Footwear Value— *Thousand of crowns*	Other Rubber Goods—Value— *Thousands of crowns*	Total Value— *Thousands of crowns*
1913	4	1,590	6,880	3,834	10,714
1921	9	1,895	13,453	7,254	20,707
1922	8	2,268	17,262	7,396	24,658
1923	8	2,546	18,606	7,432	26,038
1924	7	3,066	22,116	8,690	30,806
1925	7	3,535	27,103	10,754	37,857
1926	7	3,749	25,312	9,982	35,293

The Importance of Native Rubber

THE obstacle to Dutch cooperation in any new scheme to replace restriction is the native grower. According to the latest data available from the Dutch East Indies, it appears that native-grown rubber has a greater importance and influence than many people are prepared to admit. The extension of native areas has been greatly stimulated by the relatively high prices obtained in recent years. But at current low prices the inducement to extend production should be checked to some extent.

According to calculations made by M. Sidney Parry, the acreage under rubber has grown since 1922 from 3,208,000 to 3,787,000, apart from native holdings. The latter he estimates at 725,000 acres in the Federated Malay States, and at 1,500,000 acres in the Dutch East Indies, making a total of 6,000,000 acres. In dealing with the native estates in the Dutch East Indies Mr. Parry has relied upon statements contained in the Dutch Investigation Commission's final report upon these holdings. Apparently very large areas were planted in 1925-26 and subsequently by the Dutch natives. The natives favor close planting. Maximum production is reached in eight to ten years, but, according to the commission, the yields quickly decline after the first year or two. The commission also stated that if no new fields were planted the total production from native fields would decline badly. Mr. Parry estimates that altogether the total native position in rubber constitutes about 45 per cent of the acreage, that nearly 60 per cent of the Dutch planting area is owned by natives, and that their estates contributed 40 per cent of the production in 1927.

Gastex—New Carbon Black

ACCORDING to a recent announcement, the Grasselli Chemical Company have been appointed exclusive sales agents for a new reinforcing pigment called Gastex carbon black. This black is claimed to cost less and provide better aging qualities than other carbon blacks, and it does not retard the rate of cure. The physical properties of Gastex, which differ from ordinary channel blacks, together with its shorter rate of cure in rubber, necessitates slight changes in formulae and cures.

Gastex is produced from natural gas by a new process resulting from several years of research and development by one of the largest producers of natural gas. It is manufactured at Pampa, Texas, by the General Atlas Chemical Company which is owned and controlled by Henry L. Doherty & Co.

Schaphorst's CHATS *with the* ENGINEER

By W. F. SCHAPHORST, M.E.

Gasoline Drum Didn't Explode

A VERY interesting incident that I believe has never been published was told to me by Wm. B. Stout, the well known airplane inventor and manufacturer of Detroit, Mich.

Shortly after the absorption of Mr. Stout's company by Henry Ford, the original airplane factory caught fire and burned, although it was a so-called fireproof structure.

During the process of removing the twisted steel columns and beams Mr. Ford appeared on the scene and his comment was that the principal difference between a fireproof building and one that is not fireproof is that a fireproof building is considerably more difficult to remove after the fire has done its work.

While cutting up the twisted steel debris with an autogenous flame, one of the workmen suddenly encountered a flare and flash such as he had never experienced before and he backed away in great haste. He had set fire to something. On inspection it was found that he had cut into a drum containing gasoline, and the gasoline was burning violently.

The remarkable thing about it is that this gasoline tank or vessel passed through the intensely hot fire and held the gasoline through it all without leakage. Of course the workman did not suspect that he was cutting into a tank containing gasoline, or he certainly would have been more careful. However, no damage was done. There was no explosion. It is quite probable that such a thing had never occurred before and probably will never occur again.

How to Specify Steam

Specifications have been written for nearly everything. The last to join that class is our much used friend, "Steam." A prominent concern has prepared a "Standard Specification" for steam, as follows, to insure clean and dry steam:

"Steam shall be entirely free from all solids—both soluble and insoluble. Samples of condensed steam shall not show more than nine parts total solids per million, which is the tolerance to cover dissolved copper and iron from the test condenser, unavoidable dust contamination during the collection of the sample and its evaporation and unavoidable errors in the laboratory determination of total solids.

"Steam shall be entirely free from all moisture. Throttling calorimeter tests at any time shall not show a variation of more than 2-10ths of one per cent from 100 per cent dryness based on the determined normal of the calorimeter. The permitted variation of 2-10ths of one per cent is the tolerance for unavoidable variations in radiation and thermodynamic changes."

To some users of steam it might seem that specifications are unnecessary—that "steam is steam," and that specifications can't make it any different. But not so. There is a saving in fuel due to increase in superheat and reduced blowdowns; the 2,600 KW turbines needn't be cleaned often, if at all, thereby creating a saving of over $2,000; an important saving in packing rings and labor replacing the rings on the Corliss engine; and a saving of over $200 that would otherwise be spent for cleaning the governors on ten smaller variable speed engines.

Production Control Methods In The Rubber Industry

A Statement of the System Employed in the Akron Plants of the Goodyear Tire and Rubber Company—Control Division Active From Ordering of Raw Materials to the Inspection of the Finished Goods

By F. B. CALHOUN

MANAGER, PRODUCTION-CONTROL DIVISION,
Goodyear Tire & Rubber Company

A FEW years ago the rubber industry was expanding very rapidly. This was due primarily to artificial stimulation in industry caused by the conditions existing shortly before and during the World War. As a result, the most important economic matter of all, "the production of maximum output with present equipment and facilities at a minimum cost," perhaps was not given sufficient consideration. Subsequent developments were inaccurate records, excessive raw-material inventories, poor turnover of in-process materials, excessive material wastes, and an exceedingly high rate of labor turnover.

It should be borne in mind that the rubber industry is seasonal, subject to violet fluctuations in the price of raw materials and sales demands. The conditions above cited led the Goodyear Tire & Rubber Company to organize methods to meet this situation in the most satisfactory manner possible.

Essential Functions Segregated

The first step was to segregate the various functions essential to production control. These included the ordering and control of productive materials, the issuance of schedules, the dispatching of materials through the different processes, the stocking of raw and finished materials, transportation, and shipping.

It should be understood that these functions were actually in effect, but so decentralized or distributed between the various departments, that the management had no instrument which would permit efficient control. The selection and training of proper personnel, qualified to handle this work, presented quite a problem in itself, due to the fact that personnel experienced in control work was not available.

The function of the production-control division at the present time begins with the ordering of materials required to produce the various products manufactured. A yearly estimate is developed by the sales department, outlining probable requirements on each product manufactured by the company. This program is carefully analyzed by the management. When approved, it provides the basis for additional capacities and plant facilities where necessary. If any changes in design or equipment are contemplated the yearly estimate is given to the consulting engineer, who formulates commitments, and in turn works out the program.

This estimate is revised monthly to meet changing conditions in sales demands. This revised estimate is broken down into its component parts by the production-control division. Occasionally sales increases on certain products may largely exceed previous plans and require greater floor space, more equipment, more men, and more materials. Likewise, a decrease in sales may mean that curtailment must be made. Consequently, a definite tentative manufacturing schedule, broken down into specific quantities on each item, is compiled from market reports. It is then delivered to the production-control division. These estimates are submitted thirty days in advance of going into effect. They cover periods varying from thirty days to six months, depending upon the product. The factory decides whether the tentative program is possible.

This schedule forms the basis for releases and for planning the requisitions of materials which are not ordered on a contract basis, and on which quick shipments can be secured. The production-control division regulates the inventory on all productive materials.

From the tentative production schedule, a purchasing budget of materials is prepared. This is sent to the assistant comptroller. When approved it goes to the purchasing department as an authorization to fill the requisitions which will be placed by the production control division. The purchase budget shows the quantities of materials on hand, en route, and on order, and the coming month's requirements. In addition, the definite needs for two months ahead and the probable needs for four to six months ahead are listed. The probable inventory is also calculated for four to six months in advance. These data form the basis for contracts for materials which can be most advantageously purchased on commitments and released on shipping orders.

Purchase requisitions are made out after these budgets have been approved. The backs of the requisitions are ruled for purchasing records. In our attempt to synchronize incoming materials with consumption we are, in some cases, scheduling the plants of our vendors. To facilitate this plan further we are gradually revising layouts so that incoming materials may be dispatched direct from the receiving platform and stocked adjacent to the point of consumption. This program has enabled us to reduce storeroom space and handling charges.

Daily, weekly, bi-weekly or monthly, depending upon the product, manufacturing tickets are made up within the limits of previous estimates, and forwarded through managerial channels to the production-control division. These tickets are first checked to see that all material and equipment are available for producing. This procedure is very important in the control of in-process material because if a definitely prearranged schedule is interrupted at any point of process, due to a shortage of material or equipment, surplus inventories will result.

Classification of Stocks

All products are classified as follows: First, standard stock. Under this classification are all products that are sold in sufficient quantity to justify stocking both at Akron and in the branches. Second, Akron stock. Under this classification are all products that are sold in sufficient quantity to justify a stock at Akron only. Third, special manufacture. Under this classification are products that are made to order only, such as customer's brands, conveyor belting, hand-built hose, etc.

When the requirements are received by the central control division, they are broken down into daily machine schedules. In the compilation of these schedules, the following points are considered: First, economical grouping in order to obtain maximum machine capacities and minimum waste of material. Second, relative importance of orders on hand. An emergency order system has been found necessary because of the policy of low inventories in all lines of industry. With the flexibility which has been created

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This paper was read by Mr. Calhoun before a meeting of the Management Division of the American Society of Mechanical Engineers at Rochester, N. Y., in October, 1927. Reprinted from the Society's Transactions by permission.

in labor and equipment, emergency orders are handled without confusion.

Labor requirements are studied in a thorough manner to facilitate carrying out the production program in the most effective manner. The labor department is called upon when the ticket is received to supply trained men in numbers sufficient to handle the production. As such men are not always immediately available, the labor training department must have time to engage and train them when a larger force is to be put on, before the ticket becomes effective. Likewise, when reductions are made, the labor department must be informed so that it will stop engaging men to be trained. In such cases, transfers of employees to other departments that are active can be made, and hardships to workers avoided.

Operations of Labor Control

The control organization confers with the production and labor training foremen relative to the type of work and the number needed. Requisitions for labor and daily labor conditions reports are made out by production control for the various production departments.

The personnel working on basic schedules must be trained and developed to think in terms of production cycles. If the central control men do not do this, one department will not be properly synchronized with another.

All products, either standard or special, when placed on schedule, are allotted a definite time for completion. Occasionally normal production time limits must be extended due to a sudden influx of emergency and special orders. When this occasion arises, the merchandise distribution department is promptly notified in order that the sales department may be informed that it is necessary for the branch or customer to wait longer than usual on the particular product affected.

In order correctly to sychronize the flow of material through the plant, it is necessary for all machines to work to a time standard, scientifically determined. Therefore, all work is scheduled by machine minutes. The chart used in breaking down orders into minutes is based on piecework rates.

In order to eliminate discontent on the part of the piece-worker, earnings over an 8-hour period must be considered at the time the schedules are written. Each schedule or order received from the merchandise distribution department is broken down into production minutes and a chart is posted at intervals during the day showing work ahead of each group of machines. By the use of this chart, a decision is reached as to the number of machines and working shifts required.

A mathematical breakdown of incoming orders is not difficult, but a daily schedule properly coordinating equipment, labor, and material, and synchronizing one department with another is a task of unusual difficulty. It has heretofore been found necessary to station at different control points throughout the plant, a dispatching organization to provide shift schedules based on local conditions and assign work in accordance with the predetermined schedule. The dispatching organization must keep the schedule men, located in central control, informed in regard to back schedule, breakdowns, inexperienced labor, and various other kinds of essential information.

The centralized control of all schedules and the assignment of work to machines throughout the plant is the only method by which production can be regulated to assure harmony and uniform operating conditions.

Keeping Machines Properly Supplied

In the tire departments where certain machines are assigned indefinitely to a specific construction, the dispatching function is mainly one of keeping process inventories properly in balance. However, in the case of certain mechanical-goods departments, where a job may represent only a few minutes' work to a machine, the task of keeping the machines properly supplied with work, without delays, is rather difficult.

To assist in this work, the dispatcher is provided with job assignment orders, serially numbered, outlining the specification of the particular product. Dispatch boards have been installed and these orders are so arranged that the condition of the department is semi-graphically outlined. By this method, the production-control organization dispatches material through all operations in production and into the finished stock and shipping departments. The

ORGANIZATION

TABLE 1—SUMMARY OF CLASSIFICATION OF PRODUCTION-CONTROL PERSONNEL

Classification		Number employed Plant No. 1	Plant No. 2
1	Manager	1	1
2	Foremen	3	3
3	Head supervisors	6	6
4	Central control	7	5
5	Chief dispatchers	15	14
6	Senior dispatchers	59	41
7	Junior dispatchers	58	39
8	Stock dispatchers	12	13
9	Scalemen	7	14
10	Secretarial, clerical, and checkers	48	33
11	Clerical and messenger	1	2
	Present department average	200	156
	Total in plant	217	171
	Total in Plant No. 1		217
	Total in Plant No. 2		171
	Assistant superintendent and manager		2
	Total		390

TABLE 2—CLASSIFICATION OF DUTIES OF PRODUCTION-CONTROL PERSONNEL—PLANTS NOS. 1 AND 2

Manager	In charge of plant functions and personnel.
Foremen	In charge of division.
Head supervisors	In charge of control functions and personnel, several departments.
Plant Nos. 1 and 2—Central Control	Contact, master schedules, and materials control.
Chief dispatcher	In charge of station—all shifts.
Senior dispatcher	In charge of shift—local schedules and dispatching.
Junior dispatcher	Floor dispatching and timekeeping.
Stockkeeper	Handling and dispatching stock in and out of storage points.
Scalemen	Weighers.
Secretary and clerical	Typists, clerical work, and checkers.
Clerical and messenger	Clerical work and messenger service.

job assignment order is the authority to manufacture all products and its design varies with departments.

These assignments are typewritten and represent the largest amount of product that can be economically routed through the different departments without producing congestion, but still keeping all machines busy and providing an orderly sequence of work. The assembly of the assignment order is composed of as many copies and colors as are required for assignment of work to each individual operation, for maintaining the records necessary to intelligent dispatching, and for the rendering of the operator's or crew's time.

In the control of the wrapped-hose department, which is representative of other mechanical-goods departments, the assignment order consists of six copies; first—special white (for cost department), second—white (for stock cutting operation), third—blue (for tubing operation), fourth—yellow (for building operation), fifth—salmon (for finishing operations), sixth—pink (for finishing and assembling operations).

Each copy is sent to the succeeding operation after the previous operation has been performed and serves as authority to produce the quantity specified. Completing the operation, the supervisor places on the face of the copy, the name of the operator who did the work, the quantity, and the time required. This form is next returned to the control station. Here the clerk inserts the piecework rates and extends them to show the labor cost. This sheet, which takes the place of the traditional time card, goes to the accounting department.

The labor costs are summarized from the detailed sheets, transcribed to a master sheet, and then identified by factory order, specification, and operation numbers. As the labor is charged directly against each operation and product, this system enables the accounting department to determine just what each product is costing. In this way the products which are failing to produce a profit may be gradually eliminated and efforts concentrated on lines which make a more satisfactory return. The payroll is likewise made up from these sheets.

The combining of timekeeping and production records has reduced possibilities for errors and has eliminated much duplication in clerical work. The rendering of time and the supplying of basic cost data is a dispatching function. Generally, the making out of all time is now being handled by the production-control department.

After the different copies of the assignment order have served their purpose in dispatching material through the production departments, three copies of this order accompany the material to the

stock room. One copy is receipted and returned to the production-control department where it is filed with the manufacturing order for reference on deliveries, in case any question arises after the material is shipped. Another copy goes to finished product control which in turn notifies the merchandise distribution department that the product is available for shipment. The latter department then releases the shipping copies of the order. The third copy, in some cases only, is retained by the stock room for use in identifying material.

Daily production reports are made by each plant, summarized from the records of all shifts in each department. These reports cover the work scheduled for each line of product, the amount turned out, the overrun or shortage, the losses and their causes, the number of workers in each department, number of absentees and a summary of the total schedule, the actual production and the amount over or under the schedule. Daily condition reports are also turned in by the supervisors stating the causes of any difficulty experienced.

A monthly report summarizes these factors in all departments of each plant. Items requiring attention are pointed out and desirable changes in equipment and methods are suggested.

Incentive Wages Limited to Piece Work

Our experience on incentive plans of wage payment is somewhat limited. The establishment of piecework rates or incentive plans of wage payment has not fallen within the scope of production-control work at the Goodyear Tire & Rubber Co. It is economically correct that the operator of exceptional merit shall receive an exceptional day's pay, the average man an average day's pay, and the poor man a poor day's pay. The piecework method of wage payment recognizes this fundamental principle. The management of the Goodyear Tire & Rubber Co. has not thought it advisable as yet, other than in an experimental way, to install any incentive plans of wage payment.

However, the mechanism necessary to operate any plan of wage payment successfully is now established. Correct information for control, costing, and wage payment has been provided. The possibility and temptation of cheating by operators has been eliminated. The management tells the operator what he has produced and renders all time, rather than the reverse practice. Before wage incentives were considered in an experimental way it was believed that delays and hindrances attributed to managerial causes must be reduced to a minimum, in fairness to the operator. We believe this condition has been created in a satisfactory manner. The possibility of increasing plant efficiency through incentive stimulants becomes correspondingly less where scientific schedules and proper standards for execution are set and enforced by the management.

These remarks are made with the understanding that a well-developed plan of scientific management must include incentive plans of wage payment and as previously stated, the Goodyear management is now working experimentally on this problem based on quantity and quality.

Quality is Basis of Inspection Wages

One of our most important operations is final inspection. A form of incentive plan was introduced to see whether or not it would have any effect on quality. The basis of the incentive plan was an allowance of 50 per cent for quality of a certain standard, and 50 per cent for quantity. This system was in operation but a short time when it proved conclusively that the quality of the product had depreciated. Immediately the basis of the payment was changed to 90 per cent for quality and 10 per cent for quantity. The quality of inspection on this operation is at a higher point today than it ever has been. This particular plan has rested upon its merits and has proved successful.

To summarize briefly, an analysis and classification of the steps required in manufacturing has been made. Departments have been fully organized to handle each type of work that is to be done. A close relationship has been developed between these departments so that they work together. Output is based upon market demand through direct contact between sales and production departments.

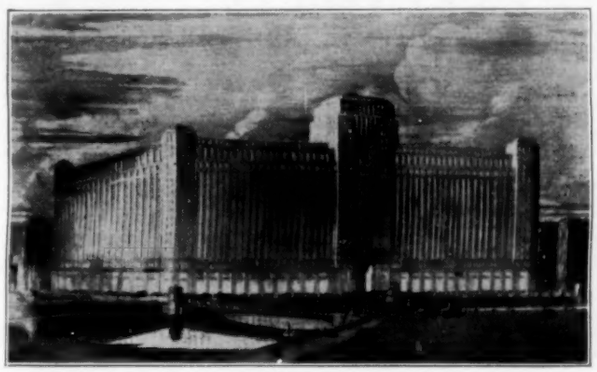
A logical, and as far as possible, automatic procedure has been established to put orders in shape for rapid manufacturing and to have men, equipment, and materials ready to handle production on a definite, smooth schedule. Production control, or the responsibility for the scheduling of work and the coordination of men, equipment, and materials to do it, has been definitely separated from actual production, or the doing of the work. Local units keep in constant touch with the progress of work and see that schedules are lived up to every hour of the twenty-four. Inventories and work-in-process have been radically reduced.

Finished stocks are kept at an economical level, but distributing branches are amply served and shipping dates are met.

Employment has been stabilized. Labor has increased in efficiency. Developments are still producing equally remarkable results, and the management has demonstrated beyond a doubt that production control in continuous process industries can be made a complete success.

Rubber to Feature in Chicago Mart

THE Merchandise Mart, which is to be erected in Chicago, is expected to contain exhibits covering the largest selection of rubber goods ever brought together under one roof. In the new structure, which will be the world's largest business building, it is planned to have



a large space given over to the products of rubber manufacturers, wholesalers and importers.

The Mart will be two city blocks in length, 18 stories high, and will contain 4,000,000 square feet of space for exhibits. It will be located in the newly created business area of Chicago, the new River District on the north-side, just across the river from Wacker Drive. It will face the river and in front of the building will be a boulevard eighty feet wide. On each floor will be great corridors, 650 feet long, with all the appearances of city business streets, on either side of which will be shops with their varied lines.

American Tires in British Malaya

IT IS an interesting commentary as regards the rubber industry that crude rubber grown in Malaya and shipped to the United States to be made into manufactured goods, should find its way back to Malaya in the form of tires, in fairly large and increasing quantities. Exports from the United States in the automobile tire class to British Malaya increased in value from $254,246 in 1926 to $471,730 in 1927, or by 86 per cent, according to the Department of Commerce. The greatest increase was in automobile casings, which advanced in unit volume from 14,536 in 1926 to 45,546 in 1927.

American tires sell in British Malaya against keen competition from all the principal foreign tire manufacturing countries, but hold the dominant position in the market. The United Kingdom, in 1926, was the chief competitor, but has since been displaced by Canada. The United Kingdom, which in 1926 exported 68,563 casings to Malaya, only shipped 38,177 casings in 1927, while Canada increased its shipments from 52,322 casings in 1926 to 80,592 during last year.

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EDITORIAL COMMENT

The Rubber Institute

THE leading bit of news in rubber circles during the last fortnight has been the recent and rather precipitous announcement of the creation of the Rubber Institute. Such an announcement must of necessity come as a surprise to those who while outside the industry are intimately connected with it in some manner or other. To all appearances and purposes the Rubber Association of America which has functioned as the coordinating body of the rubber industry for 28 years had been effective and adequate.

It is understood, however, and in fact, was stressed in the announcement of the Director General of the Institute, that no conflict of endeavor may be expected between the Rubber Association and the Institute. Where the line of demarcation between efforts lies is to be worked out later.

That there is a splendid and worth while field for both the Association and the Institute is not to be denied. There is a real opportunity in both for the most beneficial service. One can and will continue admirably to serve the industry as a clearing house for information on the operations of the industry's many departments and in caring for the myriad details connected with cooperative efforts of such magnitude. A sufficiency of policy matters will doubtless remain with the Association. The other can fill an equally important function in following strictly its declaration of purposes — the eliminiation of destructive merchandising practices, building cooperative competitive methods as against destructive competitive policies, and the like.

Institutes are no new vehicles for cooperative effort in industrial enterprises. The Steel and Iron Institute, the Textile Institute and the Petroleum Institute, all of long existence, bear witness to the efficacy of such keystone organizations covering the various industries. Incidentally all of these institutes are above and beside the many associations which exist within each of these industries and yet perform a worthy function to their respective industry as a whole. It is for the newly created Rubber Institute to find its position of helpfulness at the side of and cooperatively with the old and trusty servant, the Rubber Association, and in its measure of service and usefulness in proportion to the demonstrated value of the Association, will the Institute find its own worth.

The Silver Lining

NOW that they are faced with the necessity, it is interesting to observe how many advantages the British rubber growers are able to discover in having crude rubber at a lower price. None of these are surprising to business men who have for years followed the policy of getting the price of a commodity or article down to the point where more and more consumers can have it. In fact, it is an extraordinary thing that the advantages of comparatively low priced rubber have never appealed to the British rubber growing interests as a "consummation devoutly to be wished." In speaking of low priced rubber it is understood, of course, that a fair margin above the cost of production is assumed, a price that will give a comfortable 10 to 15 per cent return on the capital investment. Unfortunately British shareholders have heretofore been appeased by not less than 25 to 50 per cent.

The advantages to the British rubber growers at present, with the prevailing low prices, are worthy of comment, if only to alleviate the present feelings on the action of the British government in terminating restriction. The advantages are elementary enough. In the first place, low priced plantation rubber will quickly make itself felt against all substitutes for it, including reclaimed rubber, Paras and wild rubbers of various sorts.

But the greater advantage will undoubtedly be found to lie in the field of greater use for crude rubber and this is the point that is being properly stressed by the leaders in the British industry. The places in which rubber can serve when it is low-priced but from which it is eliminated when it is high-priced are indeed numerous. A principal one is underfoot where rubber paving, tiling and flooring promise to find a quick market when the prices of these materials can be reduced. The time is exceptionally ripe for extending the use of crude rubber in many ways at its present low cost and real business opportunities are offered for research and further adaption of rubber to uses which the high cost of rubber has heretofore made impractical.

Thus a low price of rubber has its compensations and the very price position of crude rubber today, plus the relinquishment of restriction, may be a blessing in disguise for the plantation industry as a whole. It may prove to be the counterpart of the proverbial silver lining to the cloud.

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NEWS of the INDUSTRY

Financial—Business
Building Operations
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STOCKHOLDER SUIT WON BY GOODYEAR COMPANY

Court Upholds Refinancing Plan Adopted by the Company Last Year—Suit Involved $16,000,000 in Accrued Preferred Dividends.

BY a decision of Judge Will C. Stephenson of the Common Pleas Court of Cleveland, O., the minority stockholders' suit against the Goodyear Tire & Rubber Company, involving the legality of the refinancing plan of the company, entered into last year, was dismissed and the plan upheld.

No written opinion was given by the court but Judge Stephenson in his statement said that the mandatory injunction brought by Kent P. Johnson, representing the minority interests, had been completely satisfied by explanations of the Goodyear officials in their testimony.

The case had been reported several times in various issues of THE RUBBER AGE. Action was originally brought to compel the payment of accrued dividends on the old preferred stock, amounting in the aggregate to $16,000,000. In the refinancing plan adopted by the company last year, new preferred shares were tendered in lieu of cash dividends on the old preferred issue and the old issue was absorbed by the new stock. The minority stockholders contended that such an issuance of stocks in lieu of a cash payment was unnecessary in view of the fact that the company had on hand $35,000,000 worth of the old issue in its treasury which could have been issued to pay off the accrued dividends.

Attorneys for the company said they believed an immediate result of Judge Stephenson's decision would be to stabilize its securities and set at rest any feeling among stockholders that they were unwise in supporting the company's program.

The group that brought the suit represented less than 1 per cent. of the stockholders, as all but a few of the 55,000 had exchanged their old preferred stock on a basis of one share of old for one and one-fourth shares of new stock before the case came up.

The company was represented by Newton D. Baker and Joseph C. Hostetler, while the plaintiff was represented by John A. Cline and Robert E. Roehm.

Lancaster Company Revived

The Fairfield Rubber Company has been recently incorporated in Ohio to take over the property and machinery of the old Lancaster Tire & Rubber Company, at Lancaster, O. The new concern will manufacture rubber heels and soles. At present the heel department of the old concern has been running periodically to supply the Godman Shoe Company of Lancaster and Columbus and it is expected that this business will continue for the new company. It is planned to also expand the sales of the new concern and if possible secure business from other shoe manufacturers. The new company is reported to be well financed and is incorporated for $100,000.

RAILROAD TRACKS TO REST ON RUBBER PADS

The government railways of the Federated Malay States are reported to be experimenting with rubber pads ¾ in. thick and 12 in. long by 5 in. in width, placed between the rails and ties, as an aid in preventing vibration and diminishing the wear and tear on the rolling stock. If the results warrant, these new pads will be made standard equipment. This new adaptation of rubber will open up another wide field for its use throughout the world.

CONGRESS ENACTS THREE MEASURES FOR MOTORISTS

The recent session of Congress, which adjourned on May 29, enacted three measures which are of prime importance to the automobile owners throughout the country and to the automobile industry in general.

The more important of the three was the repeal of the 3 per cent excise tax on the sale of motor cars, which was originally passed as a war time measure. The repeal of this tax is estimated to save motorists approximately $66,000,000 yearly. Since its enactment in October, 1917, it has produced $1,145,786,000 in government revenue.

The second measure of the last Congress was the continuation of Federal highway aid, under which $75,000,000 annually will be spent in 1930 and 1931 for public roads.

Another law enacted was the appropriation of $4,500,000 for the George Washington Memorial Highway to be constructed from Washington, via Arlington National Cemetery to Mount Vernon, the home of Washington.

The measures had the cordial support of all the automobile associations and the Rubber Association of America.

LOS ANGELES GROUP HOLD SECOND MEETING

Permanent Officers Are Elected for Ensuing Year—Dr. R. C. Riebl of Java Makes Principal Address—Meeting Discusses Calendering Processes.

THE second meeting of the Los Angeles Group of the rubber division of the American Chemical Society was held May 11 at 6:30 P. M. at the Mary Louise, Los Angeles, with R. B. Stringfield acting as temporary chairman and Emmet S. Long as temporary secretary. Fifty-two attended the meeting as compared with forty-three at the previous meeting.

After dinner, Mr. Springfield presided at a short business session, at which time by-laws for the Group were adopted and the temporary officers elected for the ensuing year as regular officers of the Group. In addition to the election of R. B. Springfield as president and Emmet S. Long as secretary, A. F. Pond was elected vice-president.

The speech of the evening was made by Dr. R. C. Riebl, of Buitenzorg, Java, who is on the staff of the Research Institute for Rubber in the Dutch East Indies and who is visiting the United States on a tour of the rubber manufacturing plants. Dr. Riebl's paper dwelt on the various work of the Institute in the production of crude rubber.

At the conclusion of his address, the meeting was turned over to J. P. McIntire, chief of production of the calender department of the Goodyear Tire & Rubber Company. Mr. McIntire outlined the subject of calendering and introduced L. A. Whitcomb, chief engineer of the Goodyear Tire & Rubber Company who gave a comprehensive and instructive paper on the mechanical features of calenders, describing calender parts and numerous problems encountered in this process of rubber manufacturing.

Also of great interest to all was the discussion presented by Dr. Kelly, chief chemist of B. F. Goodrich Company, on the weftless method of calendering. He covered the subject in detail in his talk illustrated on a blackboard.

Mr. McIntire closed the meeting after an interesting description of the Profile Thread Calender and its method of operation.

Color Company Formed

L. D. Walker and S. H. Saloman, formerly sales manager and superintendent, respectively, of Morris Hermann & Company, have recently formed the Cosmic Color Company, 878 Mount Prospect Avenue, Newark, N. J. A line of rubber colors is expected to be ready for the trade shortly, in addition to its regular line. Mr. Walker is president and Mr. Saloman is vice-president of the new company.

Hoffmann-Gottlob Patent Held Invalid on Appeal

United States Circuit Court of Appeals Unanimously Affirms Decision of District Court in Grasselli-National Aniline Litigation on Hoffmann-Gottlob Patent--Invalid on Account of Broad Claims.

THE United States Circuit Court of Appeals for the Second Circuit unanimously affirmed on May 21 the decision of the United States District Court, Southern District, New York, in the National Aniline & Chemical Co.-Grasselli Chemical Co. litigation by holding invalid the claims of the Hoffmann-Gottlob United States Patent 1,149,580 on the grounds that the patent specifications were insufficient and because the claims were too broad. The particular claims of the patent which were involved in the suit were claims 1 and 4, the former covering the use as accelerators of those ammonium compounds having a dissociation constant greater than $1x10^{-8}$ and the latter claim being for the product of the process. It was claimed that DPG, TPG and hexa were ammonium compounds within the meaning of the claims of the patent.

Patent Originally Issued in 1915

The patent was issued on August 10, 1915, to Fritz Hoffmann and Kurt Gottlob and purchased in December, 1918, from the Alien Property Custodian by the Grasselli Chemical Co. The litigation which resulted in the decision just announced had its inception in February, 1926, when Grasselli brought suit against National Aniline for alleged infringement of this patent. The trial, held in the United States District Court, Southern District, New York, lasted almost three weeks during which time many well-known rubber chemists appeared as witnesses. (Abstracts of testimony in this suit were published in March 10, 1926, issue of THE RUBBER AGE.) The decision declaring the patent invalid and upholding the stand taken by National Aniline was not handed down until January, 1927. It was this decision which was appealed by Grasselli, resulting in the present verdict upholding the lower court.

Court Criticises Lack of Clearness

In its decision, the United States Circuit Court of Appeals for the Second Circuit reviewed the history of the development of accelerators and the litigation of the patent in suit. It commented on the lack of clearness of the original German patent on which the United States patent was based and stated that, "there was not that full, clear, concise and exact disclosure which the law demands." The patent asserted, the decision continues, "first that the accelerators in question were to be bases, and also to have an alkaline reaction at vulcanization temperatures, *i. e.*, quasi-bases. Unless some true bases lose their alkalinity at those temperatures, the addition was surplusage. If they do, the disclosure was not complete because the original made no such limitation upon bases."

Another point discussed by the Court was the use of para-amino-dimethylanilin by Spence in 1913 in the Diamond Rubber Co. factory, thus ante-dating the application date of the patent in suit. The decision states, in connection with such prior use, that "Once the invention has been embodied in goods which are put in public use it becomes impossible for a later inventor to secure a patent." On June 27, 1914, Spence obtained a patent in which para-amino-dimethylanilin was disclosed as a powerful accelerator and Boggs disclosed the use of para-phenylene-diamin early in 1914 in his patent, both of these materials ante-dating July 31, 1914, the date the Hoffmann patent application was filed. There was no pretense, the court stated, that para-phenylene-diamin was not within the claims of the patent in suit, but Grasselli disclaimed para-amino-dimethylanilin.

The court summed up as follows: "We, therefore, hold that the patent is invalid, first because the specifications are insufficient, and second, because the claims are too broad. We should not, nor indeed can we, say whether if re-issued it would be valid; we cannot even know what it would be when it emerged. It is, however, not improper to observe that of the accelerators which have had substantial commercial use, only a small part are within the claims as they stand. The patentees' contribution may have been greater than that; their claims may have been unduly limited, but the dissociation constant taken alone has not apparently played a leading role in the development of this art."

It is not known at this time, according to the attorneys for Grasselli Chemical Co., whether the case will be carried any further. A decision in this connection is expected to be reached within the next few weeks.

CANADIAN RUBBER FIRMS PROTEST TARIFF CHANGES

The action of the Consumers' League of Canada in asking for a reduction in Canadian tariff duties on rubber manufactured goods has brought a strong protest from the Canadian rubber industry which contends that the present tariff protection is the only factor responsible for the growth and maintenance of the industry which otherwise could not survive the competition of the larger manufacturers in the United States. A strong effort is being made by the industry to maintain the present rates of d... and supporting briefs have been filed w... the Canadian tariff advisory board by the Association of Canadian Rubber Firms and the Rubber Association of Canada. The present tariff carries duties on rubber goods imported ranging from 20 to 30 per cent ad valorem.

Alderfer Sails to See Opening of British Plant

Mr. and Mrs. J. M. Alderfer

J. M. Alderfer, president of the India Tire & Rubber Company of Akron, sailed recently for Glasgow, Scotland, to attend the opening of the British factory of the company. The factory is at Inchinnan, near Renfrew, and will start with a production of 600 tires per day, according to Mr. Alderfer. Additional machinery will be added later and a capacity developed up to a production of 3,000 tires.

The establishment of this British factory, according to officials of the India company, has been largely financed by British distributors of India products throughout the United Kingdom and while closely allied by mutual interests with the Akron company it will operate as a distinctly separate unit. The entrance of the India company into the manufacturing field in Great Britain will place them in a position to compete more favorably with British made tires and at the same time enable them to avoid the high duties imposed at present on their American made product. The project adds another American interest to the steadily growing list of American rubber companies now operating in Great Britain.

Mr. Alderfer is accompanied on his trip by Mrs. Alderfer and will spend about eight weeks in touring Europe. In Italy they will be joined by their daughter who is now abroad studying art.

EXCHANGE DECREASES DAILY TRADING LIMITS

In view of the present stability in rubber trading on the Rubber Exchange of New York, the board of governors of the Exchange have reduced the trading limit on all future contracts from eight to five cents. The old rate was in effect since March 12, 1926. The new ruling is applicable to all trading from June 1.

In announcing the new rule, F. R. Henderson, president of the Exchange, said: "The operations on the Rubber Exchange have played an important part in bringing greater stability to the rubber market, and the Board of Governors feels that the trading limit may now safely be reduced.

"With rubber selling over 60 cents a pound, as it was when the exchange began operations some two years ago, a limit of eight cents was not too large, but today with prices around 20 cents and the Exchange functioning perfectly, it is believed that a trading range of 500 points either way is sufficient to give the necessary freedom and range of price movement."

PNEUMATICS REPLACE SOLIDS ON BUS FLEET

As a result of the 20 per cent license rebate on heavy motor vehicles using pneumatic tires included in the British budget for 1928, arrangements have been made by the London General Omnibus Company, Ltd., which operate over 4,000 large passenger buses, for replacing solid tires on its fleet by pneumatics. Contracts for the necessary change have already been given out, the larger of the contracts involved having been placed with Dunlop.

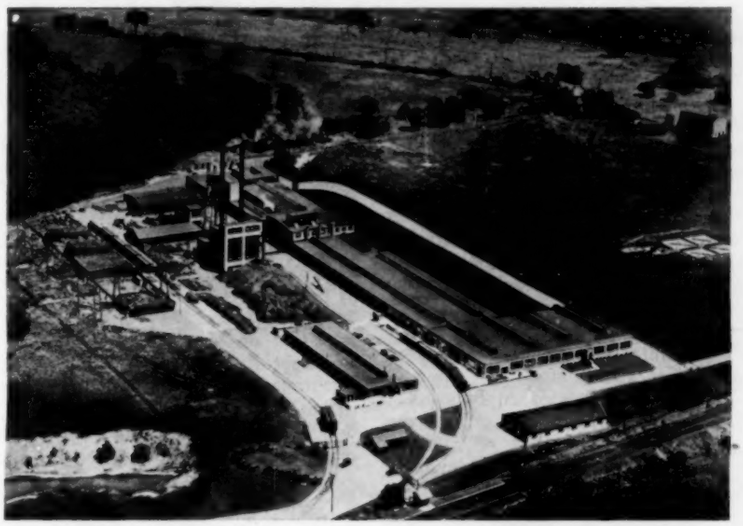
MORE RUBBER GROWERS EFFECT AMALGAMATIONS

The recent announcement in London that the amalgamation of three more rubber plantation companies has been arranged may be taken as the first indication that the rubber-growing industry is getting ready to meet the new conditions arising from the abandonment of restriction. The concerns in question are the Merlimau Rubber Estates, the Pegoh and the Consolidated Eastern Plantations. The three concerns, which are in the Shaw-Darby group, have a combined total acreage of 20,758 acres, of which 17,818 acres are planted. The decline in the price of rubber and the removal of restriction has changed radically the outlook for these merger ventures.

Rubber Substitute Company

Organization plans are reported to be completed for the incorporation of a company to produce a rubber substitute from shale. The discoverer of the formula for making such a rubber substitute is A. R. Lendner, of Los Angeles, who is now reported to have interested King C. Gillette, of safety razor fame, in the patent and secured his services to head the new company as president. The new organization will be incorporated under the laws of the state of Delaware and will be known as the Shale Rubber Company. The shale from which the rubber substitute is to be produced is said to be found in abundance in the hills of southern California and the new company has already secured options in a considerable area

A Modern Reclaiming Plant from the Air



The Oaks, Pa., Plant of the Philadelphia Rubber Works, of Akron, O., one of the largest reclaiming plants in the world and where the experiments of Dispersions Process, Inc., are being carried on.

To Make Rubber Gloves

The Trump Rubber Company, Akron, O., has completed arrangements to take over the plant of the old Eclat Rubber Company, at Kent., O., which is now operating at Cuyahoga Falls, O., for the purpose of manufacturing rubber gloves and will start operations as soon as the necessary machinery has been installed. During the time that the Eclat Rubber Company was functioning, the plant was turning out tires and tubes exclusively.

Native Tapping Resumed

Latest cable reports from the Dutch East Indies received by the Department of Commerce indicate that the low prevailing market prices for crude rubber is not deterring the native growers from tapping at capacity rates. The sharp decline in the market in April brought a temporary lull but native tappers are now reported to be returning in numbers large enough to insure an adequate labor supply for tappings during the remainder of the year.

In view of the recent announcement regarding the abolition of restriction of rubber exports from Malaya and Ceylon, the F. R. Henderson Corporation have discontinued the issue of their monthly chart showing the quantities of rubber exported from restricted and non-restricted areas. They have substituted a chart showing the monthly consumption of crude and reclaimed rubber with the ratio of one to the other.

AJAX ACQUIRES OUTPUT OF DIMMICK WHEEL CO.

The Ajax Rubber Company, Racine, Wis., have recently announced the acquisition of the controlling interest in the Dimmick Wheel Engineering Company, also of Racine.

The Dimmick Company has been manufacturing axle presses, wheel aligners, brake testing apparatus and other devices designed for servicing cars. The factory and wheel engineering school will continue at Racine. It is the plan of the Ajax Company to henceforth market Dimmick products only to distributors of the products of the Ajax Rubber Company, the McClaren Rubber Company, Charlotte, N. C., and the Racine Rubber Company.

The announcement of the Ajax Company calls attention to the decided advantage over competition which this move gives to their dealers who will now have a complete tire line that will suit all conditions of service and with equipment to maintain wheels and running gear in proper condition.

OHIO STATE STUDENTS INSPECT RUBBER PLANTS

Groups of mechanical and electrical engineering students from the senior class of Ohio State University recently paid a visit to Akron for the purpose of inspecting various industrial plants in that locality. The Goodyear Tire & Rubber Company and the B. F. Goodrich Company were among the factories visited. Lectures and discussions on various manufacturing operations and machinery were made to the class by factory officials of the two rubber companies. The groups were under the charge of professors from the university.

GOODYEAR BRINGS OUT NEW QUALITY TIRE LINE

High Priced Line is Introduced in Honor of Thirtieth Anniversary of Company—"Double Eagle" is Claimed to be the Last Word in Tires.

THE Goodyear Tire & Rubber Company has recently announced the introduction of a new tire, the "Double Eagle," which officials of the company claim is the "finest, strongest, handsomest tire that money can buy." Because of its extraordinary quality and high price, it is frankly admitted by the company's officials that the tire will probably have a very limited distribution. They point out, however, that it will fill a definite need for the car owner who wants extra quality tires.

The new tire is intended to honor the thirtieth anniversary of the founding of the Goodyear organization in 1898, officials explained. While it will not rival, commercially, the Goodyear major lines, it is being purposely made "extravagantly good," officials explained. It will be made in all the more popular balloon tire sizes, from 30 x 4.50 up to 33 x 6.75.

The Double Eagle Tire

The Double Eagle tire has been built stronger than any other tire ever made, with higher profile, virtually double-thick tread, deeper cut tread diamonds, heavier cords of Supertwist, the patented Goodyear tire fabric, extra plies, and the toughest compound that Goodyear ever developed, the officials said.

In construction, the factory experts of Goodyear developed every means to provide for longer wear, it was declared. Between the plies they placed more rubber, and lined the carcass with an extra layer of rubber. The Double Eagle tires are cured by special low temperature process, also insuring longer wear.

A gold-colored inner tube, also known and stamped as the Double Eagle, recommended for the new tire, and for which the same superior qualities are claimed as for the casing, is being made also, it was announced.

Motor Parts Sales High

Manufacturers' sales in the automotive parts and accessory industry, after establishing a new peak during March, declined slightly in April but seems certain to go to the half year mark with a new six months' record. Original equipment makers had their third largest month, only slightly below March and the previous high monthly record, October, 1925. Replacement parts business gained over March and while accessory and garage equipment sales to the trade were down slightly from March level, the aggregate for the industry was far above the average of recent years, according to the Motor and Accessory Manufacturers' Association.

KEECH MAKES RECORD ON FIRESTONE TIRES

The Firestone Tire & Rubber Company in announcing the fact that Ray Keech made his world's speed record recently at Daytona Beach with Firestone Gum-dipped tires also called attention to the erroneous reports which have been current that Frank Lockhart was likewise using Firestone tires at the time of his tragic death on April 25. The report doubtless originated from the fact that up to the time of his fatal run, Lockhart had been a staunch advocate of Firestone tires and had used them on other racing feats in which he participated. On this particular occasion, however, another make of tire was used.

In recent full page advertisements the Firestone company has proudly called attention to the number of records which have been made with Firestone tires, including the Indianapolis 500-mile race and claims that the winner of every national championship race since 1920 has used Firestone equipment.

NEW BRITISH RUBBER COMPANY IS FLOATED

Under the title of the Industrial Rubber Manufacturer, Ltd., of London, Glasgow and Burton-on-Trent, a company has been floated in England for the purpose of acquiring the modern rubber works known as Werneth Rubber Mills, at Burton-on-Trent, covering about three acres and fully equipped, and the sales organization of the Industrial Rubber Products, Ltd., London and Glasgow. The new company lists its cash working capital at £35,000 and assets at £105,490. The control of the company is in the hands of preferred shareholders.

The company will engage in the manufacture of rubber goods and parts for industrial, scientific and household purposes and as it has no outstanding contracts for crude rubber above the prevailing low market prices, it holds an advantageous position for the commencement of manufacturing operations.

FIRESTONE'S WEST COAST PLANT NEARLY COMPLETED

The Los Angeles factory of the Firestone Tire & Rubber Company, now in the course of construction, will be ready to start operations early in the summer, according to advices from officials of the company at Akron. New machinery and equipment is arriving at the plant and installations are proceeding in record time under the direction of C. A. Myers, in charge of plant engineering.

The labor department at the Akron office is taking applications for work in Los Angeles and present employees of the company who desire to make a change from Akron are being given preference.

MORTON IS KILLED BY LIGHTNING IN BALLOON

National Balloon Race Ends in Tragedy —All But One Bag Are Forced Down in Fierce Electrical Storm—Van Orman, Pilot of Goodyear Bag, Hurt.

TRAGEDY stalked at the national balloon races at Pittsburgh, on May 30, when practically all the balloon entries were forced down by storm conditions within a few miles of the take-off. Three of the bags were struck by lightning. The casualties numbered two killed and four seriously injured. Walter W. Morton, the well-known balloonist of the Goodyear company and aid to W. T. Van Orman, winner of many of the previous contests and pilot of this year's Goodyear entry, was one of the fatalities. Van Orman, himself, was seriously hurt. Lieutenant Paul Evert, pilot of the Army entry No. 3, was the other contestant killed.

The balloons, which left Bettis Field at 5 o'clock in the afternoon, entered a bad storm area near Greensburg, Pa. The Goodyear balloon was flying low at approximately 1,000 feet when struck by the lightning. Mr. Van Orman was shocked so badly that only a fragmentary account of what happened is known and it has not been determined whether Morton was killed by the lightning or in the crash as the bag came to earth. His body was found in the bottom of the basket with his head crushed.

Van Orman Still in Hospital

Van Orman, who has been one of the most prominent pilots of lighter-than-air craft, sustained a broken leg and other injuries and has been confined to the hospital since the accident. It was Van Orman who won the first Litchfield trophy by winning the last three consecutive national contests. He has also on two occasions been the winner of international races and has a long list of victories in balloon work to his credit. Morton was his aid in a great many of these events.

J. F. Cooper and Carl K. Wollam, piloting the "City of Cleveland," escaped death by a miracle when their balloon was also struck by lightning.

The winner of the race, which also secures the second Litchfield trophy, was the Army entry No. 1, which was able to weather the storm and landed the following day at Weems, Va.

AUSTRALIAN TIRES NOW DOMINATE HOME MARKET

Local manufacturers of automobile tires in Australia have now reached the point in production where they dominate practically the entire trade. A decrease in imports of automobile tires from £164,323 in January, 1927, to £94,182 in January, 1928, is indicative of the decline in the foreign casing trade. The recent drop in the price of crude rubber, however, is causing some concern among the local factories in view of the heavy stocks which are reported to have been purchased at high prices.

Names in the News

F. A. SEIBERLING, president of the Seiberling Rubber Company, recently accepted the chairmanship of the board of trustees of Lincoln Memorial University, the new Duke Hall of Citizenship. The new building is the gift of Benjamin Duke of New York. The university is located at Cumberland Gap, Tenn. Mr. Seiberling has been an active figure in the history of the institution for the past several years.

DR. H. A. WINKELMANN, technical superintendent of the Philadelphia Rubber Works Company, recently read a paper on the subject of "Reclaimed Rubber" before the Institution of the Rubber Industry in London.

S. S. MILLER, president, and A. L. DILLEY, service manager of the Mohawk Rubber Company, recently returned from an inspection trip to the Pacific Coast covering the branch offices of the company. J. F. JONES, vice-president of the concern, also went on the tour but will remain in the west for several more weeks.

A. C. KINGSTON, of the Boston Woven Hose & Rubber Company, has been appointed assistant general manager in charge of sales and also elected to the board of directors. J. W. FELLOWS, factory manager, has also been elected to the board.

DR. W. C. GEER, well-known rubber technologist, is spending the summer at Sunlight Ranch, Cody, Wyoming.

THOMAS PATTERSON, service manager of the Miller Rubber Company at their Buffalo district office, was married on May 12, to Miss Ardeth Newell, of Akron.

SIR GEORGE BEHARRELL, managing director of the Dunlop Rubber Company, Ltd., London, has been elected vice-president of the Institute of the Motor Trade.

BERTRAM G. WORK, son of the late president of the B. F. Goodrich Company, has recently sold his residence at 15 East 51sh Street, New York City, and leased a large duplex apartment at 941 Park Avenue.

G. A. TURNER, a director of Ilbert & Company, Ltd., of Shanghai, China, distributors of Firestone products in the Shanghai territory, was a recent visitor to the plant of the Firestone Company at Akron.

HARVEY S. FIRESTONE, JR., returned to the United States on May 7, after a trip of inspection to the Firestone plantation developments in Liberia. Upon his arrival, he stated that his company expected to have 30,000 acres of rubber planted by the end of the current year.

THOMAS N. HENDRICKS, of the India Tire & Rubber Company, Akron, O., has been appointed manager of the Atlanta branch office. His sales territory was formerly in the Dallas district.

HARVEY B. STOUT has been appointed sales manager of the Mason Tire & Rubber Company and while he will take over some of the duties of J. H. DIEHL, who recently resigned, he will not assume the general sales managership, which will continue to be administered by W. A. Cluff, president of the company. Mr. Cluff also announced the appointment of J. F. RANKIN as assistant sales manager and STANLEY BARNET as sales analyst. C. L. BOLLINGER has returned to the Mason organization and taken up his duties

C. L. Bollinger

as head of sales promotion and advertising. C. B. PESCHMANN, branch manager at New York, has been named Eastern division manager and W. F. LYNCH, manager at Los Angeles, has been appointed to the same capacity in charge of the Mason Pacific coast branches.

GEORGE T. OAKLEY has been appointed manager of the mechanical goods department of the Essex Rubber Company, Trenton, N. J., to succeed the late EDMUND L. STIMSON, who died recently. PHILIP B. ERMILING has been named as purchasing agent to fill the position of the late HAROLD S. BARWIS.

LESLIE MARSHALL, of the publicity department of the Firestone Tire & Rubber Company, Akron, was a recent victim of a serious automobile accident. His left hand was painfully injured.

DR. P. KLEIN, co-inventor of the anode process and president of the Hungarian Rubber Goods Factory, Ltd., Budapest, has been a recent visitor to the United States. He is spending considerable time amongst the rubber manufacturing companies around Boston and will also go to Akron.

DOUGLAS RADFORD, president of the West American Rubber Company, Los Angeles, and commodore of the Los Angeles Yacht Club, will sail one of the entries for the Sir Thomas Lipton prize for the race of sailing vessels between Los Angeles and Honolulu, a distance of 2,250 miles. The race will be made in Mr. Radford's 60-foot yacht.

PHILIPP MOLL, formerly sales manager of C. H. Boehringer Sohn, Hamburg and Neider-Ingelheim-on-Rhine, and more recently vice-president and sales manager of Dissosway Chemical Company, has become associated with the Roessler & Hasslacher Chemical Company as assistant to the manager of sales.

ROGER L. CASSADAY, of the export department of the Goodyear Tire & Rubber Company, Akron, sailed for Tientsin, China, on May 17, where he will be in the Tientsin office of his company. He has been associated with the export department of the company for the past two and a half years.

O. S. SLEEPER has been appointed engineer in charge of special development work of the Buffalo Foundry & Machine Company, Buffalo, N. Y., manufacturers of the "Buflovak" vacuum dryers, evaporators and chemical apparatus. Mr. Sleeper, who is an authority on vacuum dryers and chemical plant equipment, for the past seven years has conducted the business of O. S. Sleeper Company. Prior to that, for fifteen years, he was associated with the Buffalo Foundry & Machine Company as engineer in charge of all engineering.

A. N. ALEXANDER, formerly controller and manager of mechanical goods sales of the Murray Rubber Company, has gone to the Hood Rubber Company as assistant to the president.

DR. KARL ARNSTEIN, of the Goodyear-Zeppelin Corporation, has been granted a patent on a rigid airship which has been assigned to the Zeppelin Company of Germany. The device was worked out by Dr. Arnstein several years ago and the application filed before he joined the Goodyear organization.

DR. RICHARD C. RIEBL, of Buitenzorg, Java, and a member of the staff of the Research Institute for Rubber in the Dutch East Indies, has been a recent visitor to Akron where he is making a study of manufacturing methods.

WARREN F. JONES has been appointed chemist at the Murray Rubber Company plant, Trenton, N. J., to take the place of DR. EDWARD M. GRAFTON, who resigned recently. Other recent personnel changes at the Murray company plant include the appointment of RANDOLPH WERT as comptroller, succeeding A. N. ALEXANDER, formerly comptroller and director of sales of the mechanical goods department, who has also resigned. B. M. CALLEN and HOWARD M. STONER have now been entrusted with the management of the mechanical sales department.

ROBERT S. POPE, who has been connected with the general superintendents' office of the Los Angeles plant of the Goodyear Tire & Rubber Company, has returned to Akron to become secretary to P. W. Litchfield, president of the company. He was also formerly secretary to W. C. State, in the engineering department of the company at Akron, leaving for Los Angeles in 1920.

JAMES M. PAGLIARO has resigned as sales manager of the United Tire Stores Company to become general manager of Myers Accessory House, Harrisburg, Pa.

Timely Financial News

U. S. RUBBER SHOWS LOSS IN FIRST QUARTER

Net Loss From Own Operations Said to Approximate $750,000—Doubtful if Plantations Company Will Show Profit at Present Rubber Prices.

THE United States Rubber Company is reported to have continued to operate at a loss through April and the net loss from the company's own operations for the first four months of the current year will be in the neighborhood of $750,000, according to a recent analysis by Dow, Jones and Company. The earnings of U. S. Plantation, Inc., for the first quarter, however, were approximately $1,000,000. On the other hand, with crude rubber more or less settled around a market price of 19 cents, the earnings of the plantations company for the second quarter will in all probability be nil as the all-in cost as reported by the Plantations company for 1927 was around that figure.

It is also expected that the sale of tires in the second quarter will show an appreciable drop from the total of the first quarter in unit volume. In spite of the fact that manufacturers have all stated that no price reduction is immediately contemplated, hand-to-mouth buying on the part of dealers is continuing.

Dow-Jones also calls attention to persistent reports that the duPonts will take some definite interest in the management of the company before long. While examination of the books of the company in April revealed that the actual holdings of the duPont family did not exceed 12,000 shares it is now understood that their control extends to more nearly around 250,000 shares, most of it being held under other registrations.

Some significance in this connection is attached to the action of two of the directors who resigned shortly after they were elected at the annual meeting in March. Thus far the board has taken no action on these resignations and it is considered likely that some indications of the future intentions of the duPont interests are being awaited before accepting or rejecting them.

New Exchange Members

The following have been admitted to membership on the Rubber Exchange of New York, according to a recent announcement by Walter C. Dutton, secretary of the Exchange: LeRoy Wood, of Walter H. Bass & Company; Irving J. Louis, Vernon Metal & Produce Company, Inc.; Francis H. Geer, of Farr & Company; James F. Schwartz, of E. A. Pierce & Company, and George A. Garrett, of F. B. Keech & Company, Washington, D. C.

CATALPO!

TRADING IN RUBBER ISSUES REMAINS LIGHT

Aside from a small spurt in the market on receipt of the news that a Rubber Institute would be formed, and a slight activity on June 1, when the first meeting of the Institute was held, the trading in stock issues of the rubber manufacturing companies has been light and without incident. The rapid and spectacular rise of Mohawk common seems to have been halted and the stock has receded to 138 as the last sale recorded.

With the exception of Seiberling preferred, no new high records have been made during the fortnight, but new bottom levels for the year have been touched by Ajax, Hood and Intercontinental. In each case, however, the last three named have come back to better figures.

Rumors of consolidations among the smaller Akron companies are still persistent but without any tangible basis. It is also understood that India Tire & Rubber is seeking a new basis for a refinancing plan similar to the one worked out by Chicago interests in the case of Mohawk.

Stock exchange houses seem to think that the creation of the Institute may have a stabilizing effect on stocks of the member companies or at least bring them more in line with each other in the point of daily movements.

At present the low price of crude rubber and the fear of another reduction in tires are having the effect of holding down any speculative interest in rubber shares and until the half-yearly financial statements of the companies make their appearance the market is expected to be quiet.

Late Stock Prices

	Last Price June 4	May 18	1928 High	1928 Low
Ajax	9⅝	9½	14⅜	8⅞
Firestone	175	175	232	170
do. 6% pfd.	110	110	112	109
do. 7% pfd.	109	109¼	111½	108
Fisk	15	15¼	17¾	14½
do. 1st pfd.	89½	89¾	91½	82
General	172	170	190	165
do. pfd.	100	100	111	100
Goodrich	85½	87	99⅜	78¼
do. pfd.	114⅛	114½	115	109½
Goodyear Com.	52¾	52	72½	48½
do. pr. pfd.	96	95½	99½	92½
do. pfd.	—	100	120	100
Hood	29	—	43	28½
India	40	41	45	16
Intercontinental	12¾	12½	21⅝	11⅛
Kelly Springfield	21⅞	22	27⅜	15
do. 1st pfd.	67½	68	80	58
do. 8% pfd.	77	65½	84	65¼
Lee	21	22	24½	17¼
Miller	21	19¼	27½	18⅞
do. pfd.	79¾	70	97½	70
Mohawk	138	140	165	29¾
do. pfd.	—	84½	85	55
Seiberling	45	45	49½	35
do. pfd.	105	104⅝	107½	102
U. S. Rubber	43½	43⅜	63¼	40
do. pfd.	77½	76⅞	109⅜	76½
U. S. Rubber Reclaiming Com.	—	11½	16½	11½

LEE RUBBER GIVES OUT SIX MONTHS FIGURES

Shows Profit of $91,148 for First Half of Fiscal Year—Has Little High Priced Rubber on Hand—Expects to Make Good Showing in Next Half.

THE Lee Rubber & Tire Corporation and its subsidiaries report for the six months period ended April 30, 1928, net profits totaling $91,148 after depreciation, interest, reserves for rebates and other charges. This is equivalent to 31 cents per share on the 293,261 shares of no par stock outstanding. In the preceding year the company reported a net profit of $485,491 for six months ended June 30, or the equivalent of $1.65 per share. The fiscal year was changed, however, to end October 31 and in view of the fact that the previous six months period contained two of the best selling months, May and June, it is not comparable with the last six months as just reported.

According to the statement of John J. Watson, president of the company, which accompanied the last report, the company has consumed all of its high priced rubber on hand and at the present time has no rubber on hand or on contract at above the current market price.

The outlook for the fiscal year of the company, ending October 31 is especially good with the best months for the company's sales yet to come and inventories written down to market value. In this connection it is pointed out that Lee is one of the few rubber companies that are not members of the American rubber pool and consequently will have no loss to absorb as a result of the pool's operations.

In spite of the good showing of the company the directors are not expected to take any action on a dividend until later in the year. As of October 31, last, the current assets were more than 2½ times the current liabilities, with working capital totaling $3,705,292. Bank loans had been reduced from a total of $2,300,000 on December 31, 1926 to $1,504,000 while the contingent reserve had reached $213,200. It is expected that some of the earnings for the second half of the company's fiscal year will be used in reducing the bank loans still further.

Lee Rubber and Tire Corporation has no funded debt, no senior issues and no mortgages on any of its properties. The following is the consolidated income account of the company for the six months ended April 30, with a comparative table covering the first six months of 1927:

	6 mos. end. Apr. 30, '28	6 mos. end. June 30, '27
Net sales	$5,244,722	$6,010,385
*Expense, depreciation, etc.	5,158,512	5,658,055
Operating profit	$ 86,210	$ 352,330
Other income	‡68,429	‡200,038
Profit	$ 154,639	$ 552,368
Interest	63,491	66,877
Net profit	$ 91,148	$ 485,491

‡Includes profit from sale of securities.
*Includes reserve for rebates.

Rubber News Around the World

RAPSON COMPLETES 50,000 MILE NON-STOP TIRE TEST

Fifty thousand miles in 65 days is the achievement of Frederick Lionel Rapson, Jr., on the world's record non-stop automobile tire trial he has just completed, using the standard Rapson model double-tread tires made by his father, F. Lionel Rapson, London.

The trial was run at Miramas track near Marseilles, France, under the official observation of the Automobile Club de France. Despite the withdrawal of seventeen nails from the casings, the first set of tires completed 20,000 miles with the tubes untouched. The used deflector tubes were then fitted into four new covers and these also completed 20,000 miles without puncture. Once again the old tubes were fitted to new casings and ran without the development of trouble until the end of the trial. The car used, which was a stock Marmon, was driven night and day for over nine weeks with relief drivers. Seven new world's records were established.

CZECHOSLOVAKIA TO MANUFACTURE TIRES

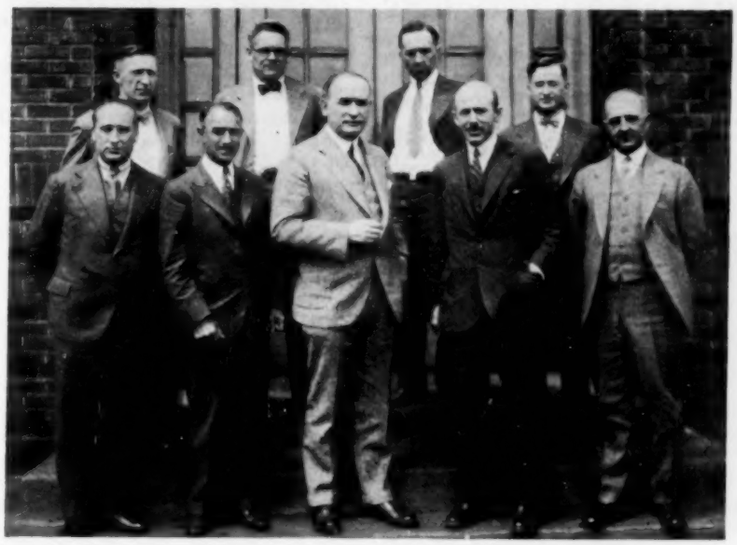
The great increase in the demand for automobile tires in Czechoslovakia has induced a prominent group of industrialists and banks in Prague to start the local manufacture of a full line of tires. In 1927 Czechoslovakia's imports of tires showed an increase of 100 per cent over 1926 and the demand is constantly increasing. The group is contemplating an arrangement to manufacture under license from a foreign firm, whose name is not yet announced. Experiments are now being conducted in Prague.

As the customs duty on rubber in Czechoslovakia is lower than in any of the neighboring countries, it is thought that in addition to local sales a good market for moderate-priced tires can be found in southwestern Europe.

French Tire Exports Decline

Exports of all kinds of rubber tires and tubes are included in one class in the French export statistics and the quantity is stated in gross weight in kilos. The number of casings are estimated, however, by taking the figure of 13 kilos as the weight per casing. The total exports for the first quarter of 1928 declined to 388,260 casings as compared with 655,040 for the same period in 1927, according to reports from the Department of Commerce.

Akron Honors Italy's Premier Rubber Manufacturer



Dr. Pirelli and a group of officials of the General Tire and Rubber Company outside the company's offices at Akron

DR. Albert Pirelli, president of the International Chamber of Commerce, and leading rubber manufacturer of Italy, employing 25,000 men, was the recent guest of Akron rubber manufacturers. He was given a warm welcome in the Rubber City and expressed the view that the rubber industry in America was operating upon a sound and economical basis.

Dr. Pirelli, together with rubber men and Akron city officials, was a guest during the Akron visit at the home of William O'Neil, president of The General Tire & Rubber Company.

The accompanying photograph was taken on the steps of the general offices of the General company. Front row from left to right: G. Venosta, general manager of Dr. Pirelli's Italian factories; C. J. Jahant, vice-president and superintendent, the General Tire & Rubber Company; William O'Neil, president of General; Dr. Pirelli; W. E. Fouse, vice-president of General. Second row: Robert Iredell, chief engineer; H. J. Conroy, H. B. Bushee, chemists; John G. Stoller, purchasing agent, all of General.

FEDERATED RUBBER, LTD., MOVES TO LIQUIDATE

At a special meeting recently held in London of the Federated Rubber Growers and Manufacturers, Ltd., the shareholders passed resolutions, subject to confirmation at a later meeting in June, which will have the effect of winding up the company's affairs. The shareholders approved the distribution among themselves of the shares which the Federated Rubber Growers and Manufacturers, Ltd., held in George Spencer, Moulton & Co.

BRITISH COMPANY TO EXPLOIT RUBBER ROADS

With the object of extending the use of rubber roads a company has been formed in England under the title of Universal Rubber Paviors, Ltd., with a capital of £105,000. In addition to the board of directors, the company has a consultative committee composed of many leading members of the rubber-growing industry. This committee is seeking the support of stockholders in rubber companies to the scheme and a prospectus is to be issued shortly to the stockholders in rubber producing companies who are members of the Rubber Growers' Association.

INTERNATIONAL PULP CO., *41 Park Row, New York, N. Y.*
SOLE PRODUCERS OF PURE **ASBESTINE** SPECIALLY PREPARED FOR USE IN RUBBER
Covered and Protected by Letters Patent Registered at U. S. Patent Office, Washington, D. C.
LIBERAL WORKING SAMPLE FURNISHED FREE

Current Crude Rubber Items

EUPHORBIA RUBBER AROUSES NO INTEREST

Sample Shipments Sent From South Africa to Manufacturers Met With No Response—Large Tracts Available if Market Can Be Developed.

IN the course of an interview upon his recent return from South Africa, Floyd E. Sullivan, formerly United States Trade Commissioner at Johannesburg, said that the possibilities for exploiting the South African Euphorbia plant as a source of rubber had been somewhat dimmed by recent developments.

Euphorbia rubber has caused considerable interest in the Union of South Africa from the standpoint of furnishing the country with a new industry. The government naturally is exceedingly keen to bring into being industries which will benefit the country and has expressed its readiness to assist, insofar as it can, private persons to develop a Euphorbia rubber industry. South Africa possesses large Euphorbia tracts from which it had been hoped rubber could be produced in commercial quantities at an economic cost.

The office of the American Trade Commissioner in Johannesburg has been called upon on various occasions in recent months to advise interested parties as to the Euphorbia rubber market possibilities in the United States. On two separate occasions sample shipments of Euphorbia rubber were shipped to this country and several manufacturers availed themselves of the opportunity to test the product. Apparently, the results of the test were not sufficiently promising to serve as an incentive for any of these manufacturers to enter into negotiations to obtain supplies of the material.

It is almost impossible at the moment to estimate with any degree of definiteness the C. I. F. American port cost of the rubber due to the fact that so far the product has only been collected in small quantities for sampling purposes. Interested persons in South Africa, however, maintain that it can be produced in commercial quantities at a reasonable cost, and have assured the office of the American Trade Commissioner that providing they are satisfied that a market exists, production in commercial quantities will soon follow.

Haiti Rubber Tapping Report

The Department of Agriculture has recently released a technical bulletin covering the results of its tapping experiments on 95 Hevea trees in northern Haiti during 1924 and 1925. The total yield of dry rubber per tree during nine months' tapping was 3.4 pounds. Individual tree records for the entire period are shown in the report. Copies of the report, known as Technical Bulletin No. 65, will be sent by the Department on request.

EFFECT OF EFFICIENCY IN PLANTATION METHODS

An interesting example of the progress which is possible in the cultivation of rubber by the adaptation of proven efficient scientific methods was given by J. G. Hay at the recent annual meeting in London of the United Sua Betong Rubber Estates.

He showed that within the course of the last fifteen years the cost of production had been more than halved, while the quality of the product was better than ever. This achievement, Mr. Hay explained, had been the result of hard work and constant experiment. The output per unit of labor employed had been gradually increased, not by an extension of working hours, but by an improved system of cultivation and tapping.

Mr. Hay went on to say that some remarkable facts emerged from a comparison of the present experience of three prominent companies, of which the United Sua Betong was one, with that of 1912. These were that the period of bark renewal is now fully twice as long as formerly, the number of trees per acre has been reduced by 50 per cent, the average yield per tree is three times as great as in 1912, the cost per pound of tapping is one-fifth of what it was then, the daily wage paid to tappers is considerably higher, and the condition under which they live has been considerably improved.

TRADING IS QUIET ON RUBBER EXCHANGE

List Improves Slightly on Factory Demand—Price Range on Distant Positions Shows Lack of Confidence in Future Market—Spot Steady at 19.00.

TRADING on the Rubber Exchange of New York during the last fortnight has been quiet and featureless but a slight improvement in the price levels can be noted. Since May 19, spot and nearby positions have gained approximately 1 cent. The interest in the market from factories has been light as evidenced by the comparatively small turnover in contracts. At the same time such trading as occurred represented for the most part actual purchases and speculative trading was nil.

Daily fluctuations between high and low levels were extremely slight and throughout the fortnight there was nothing to disturb the steady and often dull tone on the floor. While factory interest and the activities of certain foreign interests has kept the market steady, the fear of the much talked of "deluge" after November 1 is stopping any bullish tendencies. That the Exchange has no confidence in the future is easily seen in the fact that distant positions are not carrying any premium over nearby quotations and in many instances are actually below the September levels.

A petition signed by many members of the Exchange has been posted requesting that Saturdays during July and August be regarded as holidays. Daily trading limits on the Exchange have been reduced from 8 to 5 cents per pound.

Increasing anxiety is being voiced as regards the statistical position of rubber after November 1. One of the leading rubber brokerage houses is predicting that 100,000 tons of rubber will be free for shipment after that date. On the other hand, the statistical position is temporarily improved by reductions in London stocks and the fact that during the February-April quarter shipments from Malaya fell 2,500 tons less than the allowable ratio of 60 per cent standard production.

The table below indicates the daily movement in prices and the daily volume of sales.

Closing Prices on Rubber Exchange of New York, Inc.

MAY 19 TO JUNE 5, 1928

	Date	Spot	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sales*
May	19	18.00	18.20	18.40	18.50	18.60	18.60	18.60	18.70	18.70	18.70	18.70	18.80		16
	21	18.20	18.40	18.70	18.80	18.80	18.90	18.90	19.00	19.00	19.10	19.20	19.20		242
	22	18.40	18.40	18.50	18.70	18.80	18.90	19.00	19.00	19.00	19.00	19.00	19.10		238
	23	18.60	18.80	19.00	19.10	19.10	19.20	19.20	19.20	19.20	19.20	19.20	19.30		264
	24	18.90	18.90	19.00	19.10	19.10	19.10	19.10	19.20	19.20	19.20	19.20	19.20		446
	25	19.20	19.30	19.40	19.50	19.50	19.60	19.60	19.60	19.60	19.60	19.70	19.70		759
	26	19.30	19.30	19.50	19.70	19.80	19.80	19.80	19.80	19.70	19.70	19.70	19.70		271
	28	19.70	19.70	19.90	20.00	20.20	20.10	20.10	20.10	20.00	20.00	20.00	20.00		673
	29	19.50	19.30	19.50	19.60	19.70	19.60	19.60	19.60	19.60	19.60	19.60	19.60		861
	31	19.30	19.20	19.30	19.40	19.40	19.40	19.40	19.40	19.40	19.40	19.40	19.40		692
June	1	19.30	19.20	19.30	19.30	19.30	19.20	19.20	19.20	19.00	19.20	19.30	19.30	19.30	574
	2	19.30	19.20	19.20	19.30	19.40	19.30	19.30	19.30	19.30	19.30	19.30	19.30	19.50	1,241
	4	19.00	18.80	19.00	19.00	19.10	19.00	19.00	19.00	19.00	19.00	19.10	19.10	19.10	361
	5	19.00	18.90	19.00	19.10	19.10	19.10	19.10	19.10	19.00	19.10	19.10	19.10	19.10	712

(*) In lots of 2½ tons each

The Hood Rubber Company has omitted the regular quarterly dividend of $1.00 on common stock due at this time. Footwear sales are reported as not having come up to expectations this season and profits have consequently suffered.

CATALPO!

Rubber Goods and Specialties

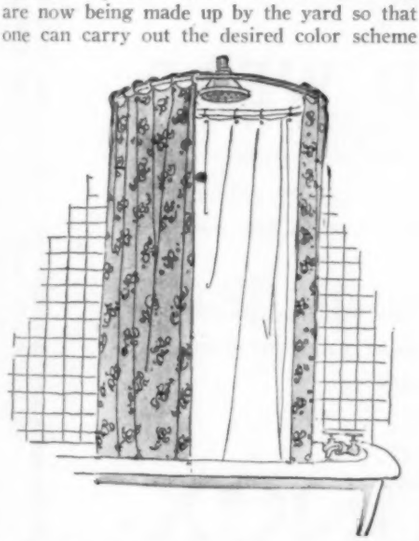
Rubber Toy Boats

A novelty for the youngsters to play with in the bath-tub or at the shore is the rubber toy boat put out by I. B. Kleinert, 485 Fifth Avenue, New York City, made entirely of semi-hard molded rubber. The pilot boat as shown in the accompanying illustration is

7¾ inches long. They are produced in red, green or blue color and present an attractive plaything for the tots. The company also makes a 10-inch rubber canoe in various colors as a similar bath-tub toy.

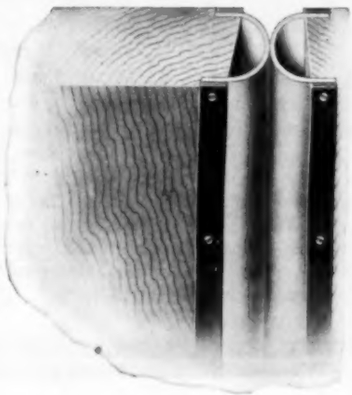
Shower Bath Curtains

With the increasing vogue of injecting color schemes into the bathroom appointments, the familiar rubber bath curtain is now being marketed in various colors and attractive designs. I. B. Kleinert Rubber Company, 485 Fifth Avenue, New York City, is offering to the trade a wide range of rubberized fabrics for bath curtains including patterned cretonnes, silk moires and serviceable ginghams in solid shades, stripes, checks or prints. These rubberized fabrics are now being made up by the yard so that one can carry out the desired color scheme



in curtains, screens, hampers or any other of the accessories of the modern bathroom. It is claimed by the manufacturers that these rubberized fabrics will hold their fresh, new appearance for a surprisingly long time, even in an especially steamy atmosphere.

CATALPO!

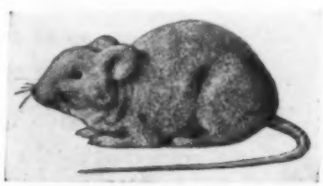


Rubber Weather Strip

A weather strip of flexible rubber material held by 1-8 by 3-4 inch steel bars is the latest development of the Richard-Wilcox Manufacturing Company, Aurora, Ill. The strip is intended for doors from 1¾ to 3 inches in thickness and can be used for the center of an opening containing two hinged doors, or the center of a four-door sliding-folding opening where two doors slide and fold back to each jamb.

Mice of Sponge Rubber

The Faultless Rubber Company, Ashland, O., has added another number to their long line of rubber toys and specialties in the form of a sponge rubber toy mouse. The sponge rubber is covered with white or grey wool flock giving the toy a realistic appearance, and making a particular appeal to the practical joker as well as the children. The

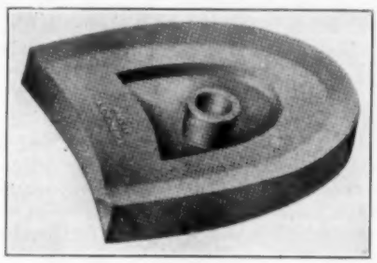


Sponge Rubber Mouse

toy has been added to the Faultless line chiefly for the trade at amusement parks, bathing beaches, circuses, fairs and summer resorts. The mice are equipped either with a rubber tail or a rubber return string.

Rubber Balloon Heels

A new type of rubber heel which embraces the principle of the balloon tire is being introduced to the trade by the Balloon Rubber Heel Company, Beverly, Mass. The heel has a patented air cushion which is designed to absorb any shock in walking. An added feature is the lightness of the new heel, due to the hollow air chamber construction. The



Heel on Balloon Principle

manufacturers claim that this construction makes the heel from one to two ounces lighter than any other standard make. Like balloon tires, balloon heels are said to reduce slipping to the minimum, by reason of the fact that the balloon surface of the heel strikes the ground first and pushing aside the water film very much like a window cleaner's rubber blade. The resulting suction from uneven surfaces prevents the skidding. As shown in the illustration there is a resilient inner rubber support which is also a distinct feature. Its hollow air cushion action supplements the balloon cushion and adds to relieve the shock.

Handle Bar Grips

A wide range of handle bar grips of molded rubber are being made by the Textile Rubber Company, Akron, Ohio, in conjunction with their complete line of other molded rubber parts for toy manufacturers. The grips are made in a variety of sizes and in a number of corrugated designs. The increasing popularity of children's toy vehicles has opened up a greatly increased field for such products. The bicycle and motorcycle fields continue important. Another new use for handle grips, only recently developed, is their application on the "joysticks" of airplanes. The company also makes hard rubber wheels, petal rubbers, scooter mats and other rubber parts for vehicle toys.

Handle Bar Grips Made by Textile Rubber Company

HEARING TO BE HELD ON WHITING IMPORT DUTY

Following an application made last year by the Taintor Company, New York, for an increase of import duties on foreign whiting, the United States Tariff Commission recently announced a hearing for June 20 in Washington to consider means of combating foreign competition on both whiting and precipitated chalk.

The commission made public on May 22 a preliminary statement covering the cost of producing these two materials based on figures received from five domestic and two Belgian manufacturers. It is believed that the domestic firms included the following: The Taintor Co., New York; Southwark Mfg. Co., Camden, N. J.; Stickney Tirrel Co., Boston; Sherwin-Williams Co., Boston, and Philadelphia Whiting Works, Philadelphia. This report disclosed that the unit value per pound in 1926 was 0.99 cent for domestic sales of whiting and 0.42 cent for foreign value of imports. Total consumption in the United States in 1926 was 251,000,000 pounds of which 62,707,306 pounds were imported.

The present duty on whiting and chalk is 25 per cent ad valorem and domestic manufacturers are endeavoring to have this increased by 50 per cent which is the maximum now permissible. Even with such an increase, it is said that the costs of production here and abroad will not be equalized.

INSURES AND SERVICES TIRES ON INSTALMENTS

The Meisel Tire Company, operating 21 retail tire stores east of the Mississippi and who claim to be the originators of the 12-payment plan of selling tires, have introduced two additional features in their sales contracts, including a free upkeep guarantee for a year, covering punctures, blowouts, cuts, and various road hazards and a guarantee furnishing protection from theft for a year.

The 12-payment plan gives the purchaser 12 weeks or 3 months to pay for tires without carrying charges or interest. The company has operated under the plan since its organization. They handle United States tires exclusively.

N. T. D. A. Advertising Layouts

The National Tire Dealers' Association is mailing to its members a series of advertisements for local use which are built around the slogan "Dependable Tires Are An Investment." Tire service and reliability of the dealer are stressed in the ads. They may be used by a single N. T. D. A. member in a city or they can be effectively presented by a group of members or by a local association. Two of the suggested advertisements are mailed with each copy of the N. T. D. A. bulletin which is distributed on the 10th and 25th of each month.

Color Firms Change Hands

Announcement has been made of the purchase by the United Color and Pigment Company, Newark, N. J., of the plants of Morris Hermann & Company and Henry Wood Sons, Boston. The United Color and Pigment Company has long manufactured a number of pigments used in rubber factories and by the acquisition of the Hermann business it adds a line of colors for the rubber manufacturing trade. Henry Wood Sons did not manufacture rubber colors.

INDIA RUBBER REPORTED SEEKING REFINANCE PLAN

A report is current in Akron rubber circles that the India Tire & Rubber Company will shortly seek a new refinancing plan somewhat along the lines of the recent arrangement made by Mohawk Rubber Company, by which a loan of $800,000 was made by a group of Chicago interests. At a recent conference of Chicago bankers and representatives of the India company no plans were consummated but it is understood that further negotiations are in progress. It was stated, however, that it would probably be several months before the finance and rubber companies come to a definite agreement.

IT PAYS TO MICRONIZE

BALANCED WEAR

NOTHING is quite so exasperating to the careful maker of quality rubber footwear as to find that the soles are outlasting the uppers.

This condition can be met and completely corrected by the inclusion in the upper stock of the requisite percentage of

MICRONEX
Reg. U.S. Pat. Off.

The World's Standard Gas Black

Full Information From

Binney & Smith Co
41 E. 42nd Street-New York City

CATALPO!

British Tire Exports Drop

Exports of automobile casings from the United Kingdom to foreign countries during the first three months of 1928 totaled only 156,760, representing a sharp decline from the figure of 283,124 casings exported during the corresponding period of 1927.

Goodyear to Have Huge Picnic

One of the greatest industrial plant picnics to be held in the United States is being planned by the Goodyear Tire & Rubber Company for July 21, at Meyer's Lake, Canton, O. Including the 17,500 employees of the company together with their families, the attendance is expected to be close to 50.000. A schedule of special buses and automobiles has been arranged to bring the crowds to the lake and an elaborate program of sports and amusements will be the order of the d'y.

The summer meeting of the Rubber Manufacturer's Association of New Jersey will be combined with an outing at the Trenton Country Club on June 18. Dinner will be served and members and guests will have an opportunity to use the links. The meeting will be the only one to be held during the summer season.

The Hodgman Rubber Company, Framingham, Mass., reports a substantial increase in the sales of their rubber air bed and camping equipment as a result of their recent dealer display advertising campaign.

The Philadelphia Rubber Works Company

Manufacturer of

RECLAIMED RUBBER

of

STANDARDIZED QUALITY

NEW YORK
52 Vanderbilt Ave.

AKRON, OHIO

OAKS, PA.
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CLASSIFIED ADVERTISING

10 cents a word, minimum charge $2.00, payable in advance.
Address replies to Box Numbers
THE RUBBER AGE
250 West 57th St., New York City

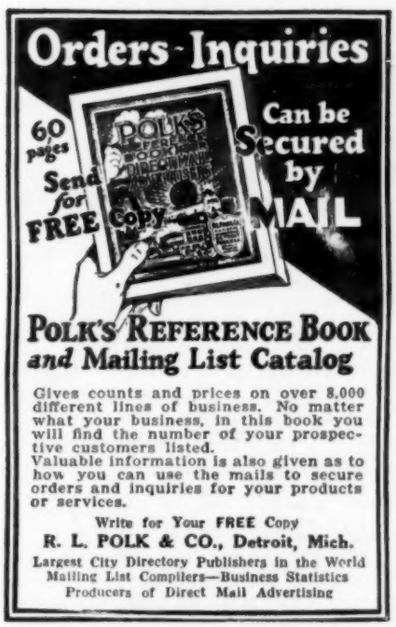
EQUIPMENT FOR SALE

One Farrel Rubber Dust Grinding Mill, complete with reduction gear drive. Rolls 13″ and 17″ by 20″; ratio 1½ to 1. Used only few times; condition like new. Mill can be seen in operation at any time. Rubber & Celluloid Products Company, 56 Ferry St., Newark, N. J.

1 Watson-Stillman 200-ton Sagger Press, complete with pump. 1 Devine Vacuum Pump and Impregnating Tanks. Igoe Brothers, Ave. A. and Poinier St., Newark, N. J.

MISCELLANEOUS

Rubber Laboratory to rent—complete in all details—reasonable rental. Industrial Rubber Corporation, 131 Harris Ave., Long Island City, N. Y.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CATALPO!

LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

JUNE 5, 1928

COTTON

THE cotton market has continued to show a steadiness of tone which has been encouraging to buyers and while the demand has been only moderate the trading has been less speculative. On the other hand, the market is still awaiting further developments from weather conditions and the boll weevil menace before settling down with any degree of assurance. It is improbable that the pest will be an important factor in the situation until the middle of July. With the handicaps under which the new crop started, the boll weevil danger, the easy absorption of last season's surplus and the fact that it is generally conceded that a higher production will be needed this year to satisfy requirements, it is doubtful if the market will decline with any suddenness. The two most bearish factors which might contribute to a slump, however, are the labor troubles at the New England mills and the usual unsettledness of industry during a presidential campaign. Closing prices follow:

	High	Low	Close June 4	Close May 18
June	.....	.....	*20.77	.....
July	21.00	20.79	20.82	20.60
August	.....	.....	*20.82	20.56

*Nominal.

Tire Fabrics

The tire fabric market during the past fortnight has remained quiet with little actual sales but with mills holding firmly to quotations and at the same time producing to capacity. Carded peeler cords and some Egyptian constructions have been the leading features in sales and inquiries from tire makers are reported as numerous. Quotations remain unchanged as follows:

CORD			
Peeler, carded, 23/5/3	lb.	.45 @	.47
Peeler, carded, 23/4/3	lb.	.46½@	.48
Peeler, carded, 13/3/3	lb.	.43 @	.43½
Peeler, carded, 15/3/3	lb.	.44 @	.44½
Egyptian, carded, 23/5/3	lb.	.57 @	.59
Egyptian, carded, 23/5/3	lb.	.60 @	.62
CHAFERS			
Carded American, 8 oz.	lb.	.39 @	.40½
Carded American, 10 oz.	lb.	.41 @	.42
Carded American, 12 oz.	lb.	.41 @	.42
Carded American, 14 oz.	lb.	.40 @	.43
LENO BREAKER			
Carded American, 8¼ oz.	lb.	.40 @	.43
Carded American, 10¼ oz.	lb.	.40 @	.43
SQUARE WOVEN			
Carded American, 17¼ oz. 23-11 ply	lb.	.45 @	.46½
Carded American, 17¼ oz. 10-5 ply	lb.	.38½@	.40

Sheetings

An improvement in the sheeting market has been noted recently with the receipt of larger orders calling for 1,000 pieces or over. Most of the deliveries, however, are for spot or nearby. Prices have declined slightly and are quoted as follows:

40-inch, 2.50-yard	yd.	.12¼@	.12½
40-inch, 2.85-yard	yd.	.11 @	.11¼
40-inch, 3.15-yard	yd.	.11¾@	.12
40-inch, 3.60-yard	yd.	.09¾@	.10
40-inch, 3.75-yard	yd.	.09 @	.09⅛
40-inch, 4.25-yard	yd.	.07¾@	.08

Ducks

The duck market has been moderately active on small sized orders over the last two weeks. Prices have remained for the most part firm, but reports of some concessions are current as a result of the efforts of some of the mills to reduce inventories. Within the last week, however, prices are reported to have stiffened.

Belting and Hose	lb.	.35 @	.38
Enameling	lb.	.35 @	.38
Single filling	lb.	.15½@	.18
Double filling	lb.	.18 @	.19

RECLAIMED RUBBER

The present low prices of crude rubber have apparently failed so far to make any dent in the demand for reclaimed and as a result no material reduction in price levels for reclaimed have been reported, and in some instances, particularly tube reclaim, the prices actually approach crude quotations. Sales, however, have largely been on contracts and whether the situation will affect new commitments is problematical. Latest quotations follow:

High Tensile			
Super-Reclaim No. 1 Black	lb.	.14 @	.14¼
Super-Reclaim No. 2 Black	lb.	.11¾@	.12
High Tensile Red	lb.	.13¾@	.14
Shoe			
Unwashed	lb.	.07¼@	.07½
Washed	lb.	.10 @	.10¼
Tube			
No. 1 (Floating)	lb.	.14½@	.15
No. 2 (Compounded)	lb.	.11½@	.11¾
Tires			
Black, washed		.09½@	.10
Black, unwashed		.07¾@	.08
Black selected tires	lb.	.08¼@	.08½
Dark Gray	lb.	.10½@	.11
Light Gray	lb.	.12 @	.12½
White	lb.	.14 @	.14½
Truck, Heavy Gravity	lb.	.07¼@	.07½
Truck, Light Gravity	lb.	.07¾@	.08
Miscellaneous			
Mechanical Blends	lb.	.07 @	.08
Red	lb.	.13½@	.14

Scrap Rubber

The scrap rubber market has remained firm during the fortnight in the face of a continuing demand from reclaimers. Accumulations are reported low and collections slow, largely due to bad weather conditions and somewhat to the lower price offered to the collectors. Latest quotations to consumers are as follows:

(Prices to Consumer)

Auto tire peelings	ton	37.50	@40.00
Standard White auto	ton	55.00	@57.50
Mixed auto	ton	24.00	@25.00
Bicycle tires	ton	25.00	@27.50
Clean solid truck tires	ton	22.00	@24.00
Boots and shoes	lb.	.01½@	.01⅝
Arctics, trimmed	lb.	.01⅜@	.01¼
Arctics, untrimmed	lb.	.01 @	.01¼
Inner tubes, No. 1	lb.	.07½@	.07¾
Inner tubes, No. 2, compounded		.04¼@	.04½
Inner tubes, Red	lb.	.05½@	.05¾
Air Brake Hose	ton	38.00	@40.00
Rubber Hose	ton	18.00	@20.00

CRUDE RUBBER

THE crude rubber market has exhibited a firm undertone during the last fortnight with prices showing a slight improvement and steadying around 19 cents for spot and nearby positions. With the general improvement in smoked sheets the Para and off-grades have also enjoyed a fractional advance. The decline of stocks in London and the moderate demand which has prevailed have contributed to the betterment of the market, but while a certain amount of bullish sentiment is in evidence the spectre of November 1 continues to loom up as a deterrent of any sharp advance.

While the factory demand has been good there are reported to still be heavy orders in the hands of brokers at one-half cent below the market. Arrivals in May are estimated at 29,300 tons, but heavy shipments are also reported afloat, indicating that while London stocks are declining the tonnage on hand in the United States is increasing.

There has been considerable interest in the market from abroad and the low prevailing prices are apparently attracting foreign consumers to increase their production. This has been reflected in many reports during the last month.

The government of the Federated Malay States recently announced that the standard production for Malaya for the restriction year would be 314,575 tons.

Prices on the New York outside market on June 4 were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot	.19 @	.19⅛	
June	.19 @	.19⅛	
July-Sept.	.19⅛@	.19⅜	
First Latex, crepe spot	.19⅛@	.19⅜	
Amber Crepe, No. 2	.18¾@	—	
Amber Crepe, No. 3	.18⅛@	—	
Amber Crepe, No. 4	.17⅝@	—	
Brown Crepe, Rolled	.17½@	—	
Brown Crepe, Clean, thin	.18⅛@	.18½	
Brown Crepe, specky	.17½@	.17¾	
Liquid Latex, per gal.	@	1.50	
Paras—			
Up-river Fine	.21 @	.21½	
Up-river Medium	Nominal		
Up-river Coarse	.15¼@	.15½	
Acre Bolivian, fine	.22 @	.22½	
Caucho Ball, Upper	.15 @	.15¼	
Islands, fine	.16 @	.16½	
Centrals—			
Central, scrap	.14¾@	.15	
Esmeraldas	.14⅝@	.15	
Guayule, washed and dried	— @	.16	
Balata—			
Block, Colombia	Nominal		
Block, Cuidad	.38 @	.39	

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers

Spot	9¼@	9⅜d
June	9⅛@	9⅜d
July-Aug.	9¼@	9½d

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LATE RUBBER CHEMICAL PRICES

Accelerators — Colors — Softeners — Compounding Materials

NEW YORK, JUNE 5, 1928

RECENT curtailment of production in some quarters has resulted in a slightly lessened demand for several of the active compounding materials according to leading producers and distributors. A distinct easing off of shipments became apparent late last month and during the first week of this month but no anxiety is felt in the trade for this condition is not expected to continue. Reductions of accelerator prices have practically stopped for only several are quoted at lower levels than at last reported. Apparently organics have reached bottom with the result that rubber manufacturers are offered these materials at the lowest price in the history of the industry. A new channel black, Gastex, is quoted for the first time and a new antioxidant, Grasselerager A has been announced, but quotations are not yet available. Both of these materials are described elsewhere in this issue. Latest prices follow:

ACCELERATORS

Organic			
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
Aero-X	lb.	.75 @	—
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.15 @	.16¼
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolylguanidine	lb.	.48 @	.50½
Diphenylguanidine	lb.	.40 @	.42½
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde Aniline, 140° m. p.	lb.	.33 @	.35½
Formaldehyde Aniline, 60° m. p.	lb.	.31 @	.33½
Grasselerator 102	lb.	.62½@	.67½
Grasselerator 552	lb.	4.45 @	4.60
Grasselerator 808	lb.	1.00 @	1.10
Grasselerator 833	lb.	1.40 @	1.55
Heptene	lb.	.45 @	.55
Hexamethylene-tetramine	lb.	.57½@	.60
Lithex	lb.	.18 @	.20
Methylenedianilide	lb.	.36 @	.37
Monex	lb.	3.25 @	—
Oynone	lb.	.68 @	.80
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92 @	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45 @	4.60
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 397	lb.	.75 @	.77½
Safex	lb.	1.20 @	1.25
Tensilac, No. 39	lb.	.50 @	.52½
Tensilac, No. 41	lb.	.50 @	.52½
Thermlo F	lb.	.50 @	.55
Thiocarbanilide, drums	lb.	.25½@	.26½
Thionex	lb.	3.25 @	—
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.65 @	.70
Vulcanex	lb.	.68 @	—
Vulcone	lb.	.65 @	—
Vulcanol	lb.	1.03 @	1.08
Waxene	lb.	.30 @	.32
Z 88	lb.	.65 @	.69
Inorganic			
Lead, sublimed blue	lb.	.08¼@	.08¾
Lead, white	lb.	.10½@	.12½
Litharge, domestic	lb.	.09 @	.09¼
Magnesia, calcined,			
light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.33 @	.35
Ultramarine	lb.	.06 @	.30
Browns			
Sienna, Italian	lb.	.05 @	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.27 @	.31
medium	lb.	.29 @	.32
dark	lb.	.31 @	.34
Chromium Oxide, bbl.	lb.	.34 @	.36
Reds			
Antimony			
crimson, 15/17	lb.	.44 @	.50
sulphur free	lb.	.50 @	.55
golden 15/17 F.S.	lb.	.18 @	.22
Indian English	lb.	.08 @	.12
Domestic (Maroon)	lb.	.08 @	.12
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Venetian red	lb.	.03 @	.06
Vermillion, quicksilver, English	lb.	1.85 @	1.95
Whites			
Lithophone, Akcolith	lb.	.05 3/5@	.06
Lithophone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanox	lb.	.10 @	.10½
Cal. Base Pigment	lb.	.10 @	.10½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.07⅛
Zinc Oxide—French Process			
White seal	lb.	.11⅞@	—
Green seal	lb.	.10⅞@	—
Red Seal		.09⅞@	—
Yellows			
Chrome	lb.	.15½@	.16½
Ocher, French medium	lb.	.03½@	.06
domestic	lb.	.01⅝@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate	lb.	.10½@	.12
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color,	ton	12.00 @	18.00
Western prime white	ton	25.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Blacks			
Arrow "Aerfloted"	lb.	.08 @	.12
Bone Black	lb.	.05½@	.11
Carbon, compressed	lb.	.07½@	.11½
Carbon, uncompressed	lb.	.07 @	.11
Drop Black	lb.	.06 @	.10
Gastex	lb.	.05¼@	.05½
Lamp Black	lb.	.12 @	.40
Micronex	lb.	.08 @	.12
Velvetex carbon	lb.	.04 @	.07
Blanc fixe dry f.o.b. works	lb.	.04¼@	.04½
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk	ton	12.00 @	14.00
Clay, China, domestic	ton	8.00 @	9.00
Aerfloted Suprex	ton	9.00 @	20.00
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Mineral Flour, c. l. fob mine	ton	20.00 @	23.00
Tensulite		15.00 @	—
Glues, extra white	lb.	.22 @	.26
medium white	lb.	.20 @	.24
Magnesia, carbonate	lb.	.08½@	.11
Mica, powdered	ton	65.00 @	80.00
Rotten Stone (powdered)	lb.	.02½@	.04½
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.30 @	3.70
Talc, domestic	ton	12.00 @	15.00
Velvetex	lb.	.04 @	.07
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.50 @	—
Superfine	ton	10.00 @	12.00
Witco	ton	12.00 @	—
Wood pulp XXX	ton	45.00 @	—
Wood pulp X	ton	25.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.18½@	.19½

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Montezuma, solid	ton	28.00 @	36.00
Montezuma, granulated	ton	32.00 @	42.00
Paradura	ton	62.50 @	65.00
Pioneer, MR, solid	ton	42.00 @	45.00
Pioneer-granulated	ton	52.00 @	55.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulphuric, 60 degrees	ton	10.50 @	11.50
66 degrees	ton	15.00 @	16.00
Tartaric, crystals	lb.	.35 @	.36
Acids, Fatty			
Stearex	lb.	.10 @	.14
Stearic, double pressed	lb.	.11½@	.12½
Alkalies			
Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.40 @	
Oils			
Corn, refined, bbls.	lb.	.11 @	.11½
Cottonseed, crude		.08½@	.08¾
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c. l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05 @	.06
Hexalin	lb.	.60 @	—
Acetate	lb.	.70 @	—
Linseed, Raw C.L. bbl.	lb.	.09½@	.10
Palm Lagos	lb.	.07¾@	.07½
Niger	lb.	.07¾@	.08
Vansulol	lb.	.10½@	—
Para-Flux	gal.	.17 @	—
Peanut, domestic, crude	lb.	.12 @	.12¼
Petrolatum, white	lb.	08⅞@	.09
dark amber	lb.	.03⅜@	.03½
Pine, steam distilled	lb.	.70 @	
Rapeseed, refined	gal.	1.04 @	1.06
Rosin, grade K, 280lb. bbl.		9.65 @	—
second rectified	gal.	.58 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	9.00 @	10.00
Rosin, grade K, 280 lb. bbl.		9.65 @	—
Pigmentar	gal.	.33 @	.41
Tar Retort, 50 gal.	bbl.	12.50 @	13.00
Solvents			
Acetone, pure	lb.	.13 @	
Alcohol denatured,			
No. 1 bbls.	gal.	.37½@	.44½
Benzol, 90%	gal.	.28 @	—
Carbon bisulphide	lb.	.05½@	.06¼
Carbon tetrachloride	lb.	.06¼@	.07
Motor gasoline,			
steel bbls.	gal.	.17 @	—
Naptha, solvent	gal.	.35 @	.40
Turpentine, spirits	gal.	.60 @	.64
wood	gal.	.50 @	.54
Waxes			
Beeswax	lb.	.56 @	.58
Carnauba	lb.	@	.50
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.07 @	.07½
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Miscellaneous			
RSL Mold Solution	gal.	.75 @	.100

ANTI-OXIDANTS

Antox	lb.	.79 @	.83
Neozone	lb.	.74 @	—
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.65 @	—
VGB	lb.	.55 @	.66

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulphur Chloride (drums)	lb.	.03½@	.06
Sulphur flour,			
Superfine bags	cwt.	2.20 @	2.80
Superfine, bbls.	cwt.	2.55 @	3.10
100% pure, refined,			
bags	cwt.	2.60 @	2.15
bbls.	cwt.	2.95 @	3.50

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

THE imports of crude rubber held up well during April, totaling 37,958 tons, but did not come up to the heavy arrivals of the same month last year. Crude rubber invoiced and afloat to the United States shows an increasingly heavy tonnage coming forward. Consumption during May is expected to equal April's absorption.

Market prices in London and New York have held firm at around 19 cents with little fluctuations between the daily quotations. The market is still anxious, however, over the possible developments in the statistical position of crude rubber immediately before and after November 1. At the same time the market has been encouraged by the buying interest manifested by factories both here and abroad and by the continued decline in stocks in London. Stocks in the United States, in view of heavy expected arrivals will probably show an increase.

Automobile production in April set a new record and far exceeded any monthly output last year. There was a noticeable increase in Canadian production. This high automotive output is also reflected in the large number of rims inspected and approved during April.

Latest figures covering imports and exports in the leading consuming and producing markets are included in appropriate tables in this section.

Beginning with the next issue the statistical section will be enlarged to include figures on reclaimed rubber.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1926:							
Jan.	42,404	72,528,151	76.36	2,059	3,747,505	81.24	40,345
Feb.	32,865	58,733,370	79.78	1,430	2,280,168	71.17	31,435
Mar.	42,152	70,589,581	74.76	1,836	2,735,234	66.51	40,316
Apr.	34,544	48,742,539	62.99	1,128	1,605,093	63.58	33,416
May	29,756	36,896,080	55.35	1,052	1,558,987	66.17	28,704
June	24,900	34,498,561	61.85	1,105	1,371,217	55.41	23,795
July	35,820	33,061,281	41.20	1,554	1,743,854	50.09	34,266
Aug.	27,400	24,670,752	40.21	1 318	1,339,563	45.38	26,082
Sept.	37,112	32,625,032	39.25	1,437	1,519,870	47.20	35,675
Oct.	29,746	25,320,558	38.49	1,366	1,316,270	43.03	28,110
Nov.	39,155	34,890,536	39.78	1,482	1,411,517	42.51	37,673
Dec.	37,754	33,261,366	39.33	1,904	1,841,305	43.16	35,850
1927:							
Jan.	43,340	36,753,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984,377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	35.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,671
Nov.	38,592	27,395,428	31.69	2,469	2,014,196	36.43	36,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,108	30,278,444	34.56	1,988	1,734,990	38.95	37,120
Feb.	33,664	27,763,655	36.82	2,738	2,229,589	36.35	30,926
Mar.	40,688	32,109,376	35.23	3,718	2,587,434	31.07	36,950
Apr.	37,958	27,296,346	32.23	2,272	1,415,024	27.80	35,686
May							
June							
July							
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1921	1922	1923	1924	1925	1926	1927	1928
Jan.	5,045	16,938	30,106	29,058	29,638	32,196	31,518	34,408
Feb.	5,955	14,767	30,149	25,736	29,761	31,136	30,137	33,702
Mar.	9,190	21,408	36,629	28,385	33,498	32,936	36,141	35,688
Apr.	13,084	19,294	29,085	27,129	34,139	32,696	35,871	32,772
May	16,023	23,246	36,155	25,845	35,322	29,364	34,592	
June	16,142	31,713	24,272	22,753	35,822	28,598	33,801	
July	18,310	24,522	17,685	23,396	36,053	27,577	29,219	
Aug.	23,649	29,361	20,359	28,982	35,909	34,533	33,460	
Sept.	16,705	24,410	17,594	31,497	31,691	32,904	27,214	
Oct.	16,814	26,881	21,321	31,520	29,047	29,836	26,790	
Nov.	14,105	24,950	20,437	27,289	28,853	28,080	26,792	
Dec.	15,482	25,070	21,902	27,199	28,748	26,293	25,492	
Totals	170,504	282,560	305,694	328,769	388,481	366,149	371,027	

Figures on Quarterly Basis

Quarter	1921	1922	1923	1924	1925	1926	1927	1928
Jan./Mar.			96,776	87,609	95,263	94,301	99,216	103,558
Apr./June	65,463	127,360	89,493	75,674	104,099	87,109	103,242	
July/Sept.			55,621	83,813	99,493	93,793	89,210	
Oct./Dec.	105,962	155,067	63,617	92,656	85,789	83,212	80,860	
Totals	171,425	282,427	305,507	339,752	384,644	358,415	372,528	103,558

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
March 31	2,652	528	1,028	776	4,984
April 7	3,061	718	1,381	882	6,042
April 14	3,097	606	1,585	209	5,497
April 21	4,190	42	1,215	2,535	7,982
April 28	2,498	484	895	739	4,616
May 5	4,220	652	1,464	1,177	7,513
May 12	2,797	331	1,374	785	5,287
May 19	3,210	429	1,334	723	5,696
May 26	4,404	435	1,409	2,921	9,169
June 2	3,799	1,020	1,306	1,094	7,219

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1925																																
September	58¼	57¾	55	51¾	51¾	—	73¼	80⅞	83	86½	92	92½	—	—	93½	93⅝	92¾	92¾	94¼	—	92	93¾	93⅞	90	89	89	—	89⅝	91¾	91½	—	88⅞
October	91¼	91¼	92	—	94½	97	97½	99	99¼	101	—	97¾	95½	97	99¼	99¼	99	—	99	101¼	102	99¾	99¾	99¾	99¾	98	99¾	99¾	101½	100¼	98
November	—	99¾	—	95¾	88⅛	100	100¼	—	88⅝	99⅛	100¼	101⅜	104½	105½	—	99¾	99¾	107	109⅜	110⅜	110½	110⅜	109	106¼	—	108¾	108¾	107	—	104¼
December	106⅝	108½	107¾	107¼	108¼	—	108	109	109¾	106	103½	105½	—	101	99¾	99¾	98	98¾	98⅝	—	88¾	90¾	88¾	88¾	—	—	—	91	93	91¼	91¼	95½
1926																																
January	—	—	87	87¼	85½	86½	87⅛	—	87⅝	—	88¾	88¾	88¾	85½	84½	82½	—	75¾	75½	75¾	75	72½	—	—	66½	67	67	69¼	70½	69	—	79½
February	67	67¼	66¾	68	—	—	69	—	67	66	66	66	65½	—	63	60½	60	60	59	—	82	86	—	—	51¾	51	—	—	—	—	—	62¾
March	55	58	53	53½	53½	57½	58	56	56½	53	60	63	61½	—	62	60½	61	62	61	—	61	61	61	60	59½	60	60	61	59¾	68½	68	59
April	59	—	59	59	59	58	56	56½	53	61	61	61½	—	—	62	60½	61	61	61	—	61	61	61	60	59	60	60	61	59	48½	48	61¼
May	48½	—	50	50¼	49¼	49¾	49¼	49½	—	49½	49	48½	—	49¾	47¾	48½	47½	47½	47½	—	47½	48½	48½	46	48	48	48	48	49	48	—	47¾
June	41½	42	41¼	42	41¼	—	41½	41½	42	41¾	42	41½	41	42	43½	47½	47	47½	43	—	44	44	43½	43½	41½	45	45	46	43	42	—	42½
July	43	42	42	42	41¼	—	41½	41½	43	41½	42	41½	41	40	40	43	40	40	40	41½	41	41	41½	41½	41½	45	45	45	43	42	39	41¼
August	—	40¼	40¼	38¾	38¾	37	38¾	40¼	40¼	40¾	40¾	37½	37½	38½	40¾	40¾	38	40¼	40	41¼	39½	41	39¾	41¾	39	39	39	41	39½	39½	40	38½
September	40¼	40¼	40¼	—	—	87	—	40¼	42½	42½	42	42½	42	42	42	40¾	42¼	42¼	42¾	—	42¼	42¾	42¾	42¾	42¾	42½	42½	42½	42½	42½	42½	41	42½
October	43	—	41	41¼	41¼	43¾	42¾	42½	41¾	41¾	41¾	41¼	41½	41¼	41¼	40¾	40¾	40¾	41¼	42¼	41	42¾	42¾	42¾	42¾	42½	42½	42½	42½	42½	—	42½
November	41¼	—	—	41¼	41¼	41½	41¾	41¾	41¾	42¼	41¾	41¾	—	41¼	41¼	40¾	40¾	40¾	41¼	42¼	41¼	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	—	—	42¾
December	36¾	37¼	37½	37½	—	87	—	87¼	87	87	87	87½	—	87¼	87¼	88	88	88	88	88	88	88	88	88	88	88	88	87	87	87	87	87½
1927																																
January	—	—	38½	39	39¼	39¾	—	40¼	—	40½	40¾	40¾	40	39¾	39¾	—	39¼	38¾	38¾	38¾	38¾	38¾	38¾	38¾	38¾	38¾	38¾	38¾	38¾	38¾	38¾	38¾
February	—	87¼	87½	87½	87½	—	—	87¾	87¾	87¾	87¾	87¾	—	88	88	88	88	88¾	88¾	88¾	88¾	88¾	89	89	89	89	89	89	89	89	89	89
March	—	89¾	89¾	40	40¼	40¼	40¼	40¾	40¾	40¾	41¼	41¼	41¾	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼
April	—	41¼	41¼	41	41	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41	41	40¾	40¾	40¾	40¾	40¾	40¾	41	40¾	40¾	40¾	40¾	40½	40½	40½	40½	40½	40½	40½
May	—	40½	40¼	40½	40¼	41¼	41¼	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾
June	—	40¾	40¾	40¾	—	—	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾
July	—	85½	—	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½
August	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½
Sept.	84	83¾	—	83¾	83¾	—	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾
Oct.	83¾	—	83½	83½	83½	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾	83¾
Nov.	85	85½	85½	85½	85½	86½	86¾	—	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
Dec.	40¼	40¼	40¼	—	40¼	40½	40½	40	—	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½
1928																																
January	—	—	41¼	41¼	41¼	41¼	41	—	41	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½
February	87½	87¾	87¾	87½	—	87	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾	86¾
March	29	28¾	27½	27½	27½	26¾	25½	25½	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼
April	—	27¼	27¼	27½	27½	27¼	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
May	—	17½	18¾	19¼	19¼	—	—	18¾	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼
June	—	19¾	—	19¾	19¾	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99
June	15.11	26.88	18.81	77.26	42.50	37.25	
July	14.67	26.10	22.16	103.16	41.03	34.44	
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Sixth Restriction Year—Third Quarter

Day	May	June	July	Day	May	June	July
1	8¼	9⅝		17	8⅝		
2	8⅝	9⅝		18	8⅝		
3	8⅝	—		19	8⅝		
4	8¾	9⅛		20	—		
5	8¾	9⅛		21	8¾		
6	—			22	8¾		
7	8¾			23	8⅞		
8	8¾			24	9⅛		
9	9⅛			25	9⅛		
10	8¾			26	—		
11	8⅞			27	—		
12	8⅞			28	—		
13	—			29	9½		
14	8¾			30	9½		
15	8⅞			31	9½		
16	8¾						

(The average price for the period for which daily prices are reported above is approximately 8.905 pence. The British Colonial Secretary has announced that only 60% of the standard production will be exportable from the restricted area during the next quarter if the price during the entire current quarter does not average at least 21 pence.)

Average Price in Previous Quarters

Quarter	1922-23	1923-24	1924-25	1925-26	1926-27	1927-28
Nov.-Jan.	14.285	14.175	17.9983	46.709	19.265	19.023
Feb.-Apr.	16.858	12.917	19.356	28.103	19.696	12.591
May-July	14.242	10.947	38.469	21.001	18.165	
Aug.-Oct.	14.944	14.632	43.269	20.199	16.620	

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	May	June	Day of Month	May	June	Day of Month	May	June
1	22.30	21.05	11	22.05		21	21.55	
2	22.00	21.05	12	21.85		22	21.65	
3	21.35	—	13	—		23	21.60	
4	21.35	21.35	14	21.55		24	20.95	
5	21.40	21.15	15	21.75		25	21.10	
6	—		16	21.55		26	21.10	
7	21.95		17	21.95		27	—	
8	21.95		18	21.70		28	21.05	
9	21.85		19	21.60		29	21.05	
10	21.95		20	—		30	—	
						31	21.05	

Average Monthly Price Per Pound

Month	1926 Cents	1927 Cents	1928 Cents	Month	1926 Cents	1927 Cents	1928 Cents
Jan.	20.85	18.42	19.12	Aug.	18.57	20.04	
Feb.	20.60	14.10	18.40	Sept.	17.02	21.95	
Mar.	19.35	14.32	19.38	Oct.	13.14	20.55	
Apr.	19.13	14.75	20.63	Nov.	12.86	20.22	
May	18.92	16.07	21.58	Dec.	12.68	19.58	
June	18.57	16.85		Average for Year	17.53	17.49	
July	18.71	18.00					

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	55,198	76,172	110,244	46,296	45,312	41,256	100,434	121,484	151,500
Feb.	58,035	91,186	108,955	46,935	42,166	43,316	104,970	133,352	152,271
March	61,822	85,740	114,061	43,567	49,600	39,324	105,389	135,340	153,385
April	55,261	92,757	113,083	41,905	38,963	33,986	97,166	131,720	147,069
May	64,360	94,563		40,303	44,181		104,663	138,744	
June	60,460	89,250		40,907	47,233		101,367	136,483	
July	64,900	98,469		38,062	40,587		102,962	139,056	
Aug.	60,870	96,145		37,360	40,937		98,230	137,085	
Sept.	62,078	97,829		42,464	37,966		105,542	135,793	
Oct.	64,089	97,452		52,930	42,804		117,919	140,256	
Nov.	69,385	101,034		47,311	37,076		116,696	138,110	
Dec.	72,520	100,130		52,020	47,938		124,540	148,068	

(Rubber Association of America figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1920	1921	1922	1923	1924	1925	1926	1927
Jan.	19,300	56,573	67,252	73,498	57,460	27,172	9,994	54,994
Feb.	18,329	59,439	67,623	70,483	56,732	23,425	10,004	58,826
Mar.	18,969	63,913	66,670	63,438	55,647	18,104	13,127	63,055
Apr.	20,072	68,759	68,637	58,770	54,559	12,949	18,778	66,897
May	20,921	70,403	70,146	54,439	51,615	5,895	20,384	67,169
June	22,517	69,408	71,597	51,050	51,115	5,818	23,984	63,902
July	25,346	71,065	71,515	49,937	52,073	4,258	27,727	63,717
Aug.	30,674	73,211	72,112	58,427	49,700	4,619	30,165	64.491
Sept.	35,504	72,175	70,977	54,523	44,011	5,453	35,077	68,236
Oct.	41,743	69,229	68,536	58,891	37,523	5,086	42,138	69,569
Nov.	45,550	70,786	68,548	60,074	33,593	3,869	44,057	67,050
Dec.	50,652	69,792	72,299	60,246	29,488	5,697	48,918	63,793

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1927					
July	63,917	64,163	63,511	62,819	63,626
August	64,177	64,557	64,842	64,259	———
September	65,162	66,148	66,664	67,253	———
October	68,519	70,167	70,916	70,060	69,551
November	69,660	69,501	69,850	67,318	———
December	65,869	66,011	64,761	63,397	63,207
1928					
January	64,360	65,524	65,450	66,285	———
February	65,909	64,945	63,769	63,103	———
March	61,978	61,920	61,033	59,644	58,197
April	58,732	58,945	56,819	53,360	———
May	52,015	50,837	48,705	44,628	———
June	43,716				

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1926	1927	1928	End of	1926	1927	1928
Jan.	16,726	25,440	25,868	July	23,101	22,558	
Feb.	13,653	26,766	22,867	Aug.	23,362	25,764	
Mar.	18,389	27,844	20,538	Sept.	25,997	25,178	
Apr.	16,328	24,543	16,946	Oct.	26,614	25,790	
May	16,967	25,133		Nov.	25,486	28,369	
June	19,416	21,898		Dec.	26,443	25,798	

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1925	26,001,664	66.8
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1927			1928		
July	1,679,587	84.4	January	1,811,534	87.8
August	1,825,905	80.2	February	1,806,437	86.5
September	1,727,122	77.7	March	2,420,084	86.4
October	1,354,924	81.4	April	2,316,324	88.4
November	838,591	67.8	May		
December	1,134,421	80.0	June		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1924	1925	1926	1927	1928
January	11,918,000	14,386,000	17,582,000	17,888,000	20,939,000
February	9,626,000	13,210,000	15,814,000	18,240,000	21,136,000
March	10,961,000	14,890,000	19,302,000	22,464,000	24,041,000
April	14,583,000	19,013,000	20,848,000	23,371,000	25,712,000
May	15,889,000	20,459,000	24,213,000	26,579,000	
June	16,421,000	20,724,000	23,803,000	27,799,000	
July	18,610,000	22,879,000	24,752,000	29,784,000	
August	19,825,000	22,323,000	26,912,000	29,779,000	
September	16,871,000	20,177,000	22,929,000	28,409,000	
October	18,029,000	19,826,000	23,973,000	25,497,000	
November	16,607,000	18,024,000	20,618,000	24,400,000	
December	15,663,000	17,954,000	21,419,000	23,718,000	
TOTAL	185,003,000	223,865,000	262,165,000	297,928,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	40,932	45,259	51,633	60,845	61,237	64,439
Shipments	39,987	45,204	50,120	59,262	59,002	64,059
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	4,587	4,965	5,491	2,974	4,932	5,394	9,947	10,432	9,949
Feb.	4,865	5,095	6,363	3,436	4,458	5,031	11,164	11,075	11,721
Mar.	5,456	6,276	6,819	4,561	5,701	5,731	12,004	11,583	12,389
Apr.	5,346	6,299		4,980	5,701		12,461	12,122	
May	5,023	6,151		5,211	5,657		12,348	12,462	
June	5,422	6,202		5,724	6,253		11,968	12,462	
July	4,950	5,087		6,337	5,973		10,592	11,326	
Aug.	5,872	5,752		6,744	6,393		9,732	10,721	
Sept.	5,706	4,822		6,040	5,717		9,318	9,722	
Oct.	5,103	4,773		4,544	4,799		9,917	9,665	
Nov.	4,324	4,502		3,733	4,306		10,297	10,136	
Dec.	4,683	4,497		4,718	4,165		10,456	10,264	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	50,850	60,116	70,706	82,614	76,618	70,823
Shipments	49,673	59,072	68,016	81,004	71,591	72,896
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	6,809	5,337	5,441	3,723	6,016	6,072	14,361	15,585	12,982
Feb.	6,825	5,658	6,895	3,736	5,120	5,431	17,090	16,075	14,650
Mar.	7,030	7,184	6,231	4,987	6,157	5,731	19,131	17,096	15,573
Apr.	6,554	7,373		5,051	6,359		20,674	17,801	
May	6,149	6,737		6,304	6,140		21,141	18,389	
June	6,171	6,306		6,898	6,832		20,243	17,858	
July	5,729	5,284		8,569	7,070		17,267	16,004	
Aug.	7,424	6,480		9,579	7,983		15,462	14,664	
Sept.	7,590	5,651		7,762	6,758		15,312	13,511	
Oct.	6,208	5,065		5,474	5,024		15,929	13,539	
Nov.	4,852	4,775		4,045	4,723		16,604	13,585	
Dec.	5,277	4,969		5,463	4,712		16,200	13,692	

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1921	1,595,304	1,452,902	142,402	66,246	61,098	5,148	1,661,550
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927							
Jan.	238,926	199,650	39,276	15,376	11,745	3,631	254,302
Feb.	304,758	264,171	40,587	18,655	14,826	3,829	323,413
March	394,430	345,911	48,519	23,250	19,723	3,527	417,680
April	404,743	357,009	47,734	24,611	20,890	3,721	429,354
May	404,099	357,148	46,951	25,708	21,991	3,717	429,807
June	321,959	278,728	43,231	19,208	16,470	2,738	341,167
July	268,474	236,866	31,608	10,987	8,719	2,268	279,461
Aug.	308,807	274,378	34,429	12,526	10,139	2,387	321,333
Sept.	260,420	226,440	33,980	11,262	8,681	2,581	271,682
Oct.	219,712	183,041	36,671	7,791	6,236	1,555	227,503
Nov.	134,381	109,742	24,639	6,617	5,173	1,444	140,998
Dec.	133,178	105,784	27,394	3,435	2,277	1,158	136,613
TOTAL	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	233,502
Feb.	323,368	290,830	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May							
June							
July							
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[2]							
	Gross Exports	Gross Exports Minus Imports	Imports	Ceylon[3]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1926:															
Jan.	30,452	10,237	20,215	4,246	1,273	416	472	289	4,110	6,239	8,165	866	1,284	1,805	49,380
Feb.	30,440	8,306	22,134	5,120	725	488	450	253	4,524	5,717	6,854	554	2,759	1,978	51,556
Mar.	35,012	14,800	20,212	5,177	1,113	792	561	418	4,527	5,566	11,984	573	2,126	1,899	54,948
Apr.	23,727	10,565	13,162	3,766	590	679	374	293	4,226	4,598	6,285	410	2,318	1,529	38,230
May	31,231	10,604	20,627	3,944	691	927	410	279	4,440	5,358	8,737	502	1,353	1,464	48,732
June	30,624	11,764	18,860	4,208	452	779	512	275	4,444	6,125	10,614	549	1,213	1,279	49,310
July	28,824	15,280	13,544	4,422	938	911	498	439	4,618	5,612	13,112	1,521	1,565	1,148	48,328
Aug.	34,625	13,595	21,030	5,666	521	890	476	316	4,132	5,699	10,390	378	1,888	1,097	52,483
Sept.	35,913	13,972	21,941	6,015	651	888	689	457	4,065	6,568	11,391	681	2,156	822	56,324
Oct.	39,367	15,203	24,164	5,672	634	805	473	385	4,058	6,998	11,491	661	1,904	1,023	58,268
Nov.	34,302	12,201	22,101	4,228	1,110	685	547	285	3,988	5,816	9,422	718	1,911	1,259	52,070
Dec.	36,811	14,716	22,095	6,498	1,176	895	617	338	5,054	7,117	12,786	790	3,821	714	61,901
1927:															
Jan.	34,946	14,995	19,951	6,697	921	959	585	304	4,187	6,706	10,690	941	3,482	981	56,404
Feb.	27,528	11,697	15,831	3,571	1,469	552	445	360	4,078	6,526	10,535	675	2,104	1,098	47,244
Mar.	41,346	17,464	23,882	7,142	1,124	997	639	432	5,657	7,004	12,905	733	3,178	1,791	65,484
Apr.	29,041	13,069	15,972	3,349	723	984	452	526	4,666	5,531	10,197	557	2,451	1,520	46,928
May	31,393	15,491	15,902	3,124	760	786	415	348	5,430	5,529	13,410	586	2,460	1,207	49,957
June	32,607	14,706	17,901	3,348	856	1,100	539	409	4,818	5,518	9,109	772	889	1,731	46,990
July	23,947	12,697	11,250	4,018	827	859	544	333	4,771	6,142	11,566	519	1,757	1,113	43,699
Aug.	30,371	17,105	13,266	5,357	688	1,133	623	546	4,355	6,682	12,440	716	1,928	969	48,703
Sept.	29,835	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,072	1,213	48,066
Oct.	29,846	15,801	14,045	5,245	802	721	591	542	3,810	7,755	13,633	775	2,752	939	51,520
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	591	600	4,127	6,587	14,395	683	2,369	1,627	46,378
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,763	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,731	16,618	11,113	4,352	1,605	842	500*	525	4,851	7,988	11,360	720	2,273	1,200*	47,329*
Feb.	28,813	12,911	15,902	4,353	1,081	667	500*	536	4,052	6,757	8,635	723	1,612	1,200*	46,018*
Mar.	27,813	10,508	17,305	3,460	775	645	500*	269	3,999	5,826	9,690	613	2,750		
Apr.	20,029	9,335	10,694		518	630	500*	258					1,014		

(1) Mayalan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, and 3,263 in 1926. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, and about 20 tons in 1926. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, and about 60 tons in 1926. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Italy, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States*	United Kingdom	France (h)	Germany	Canada (ac)	Japan (ac)	Italy	Russia (ce)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,643
1926:															
January	40,345	6,886	2,832	703	2,188	892	760	332	438	76	163	303	89	134	56,141
February	31,435	3,114	3,063	1,113	1,865	741	1,041	643	512	143	88	397	145	75	44,375
March	40,316	8,907	3,941	1,342	2,079	864	1,037	832	547	129	227	377	109	161	60,868
April	33,416	8,275	4,121	1,781	1,615	1,868	865	402	505	71	93	335	130	193	53,670
May	28,705	6,773	2,519	1,848	1,239	1,010	705	200	468	186	241	225	60	192	44,371
June	23,795	5,894	2,196	1,655	1,188	1,465	1,070	983	636	269	215	303	123	103	39,895
July	34,266	6,768	2,352	2,202	1,552	1,447	800	132	702	295	480	292	121	115	51,524
August	26,081	7,327	2,457	2,110	1,888	1,284	796	655	1,275	303	594	336	90	151	45,347
September	35,675	8,843	1,774	2,029	1,355	1,922	819	472	1,241	283	429	317	91	138	55,388
October	28,110	8,082	3,376	2,423	1,865	2,396	645	585	1,004	301	2	360	100	121	49,870
November	37,673	9,247	2,719	3,007	1,548	3,380	832	568	916	194	-18	358	90	181	60,695
December	35,850	4,749	2,890	2,562	1,847	856	439	725	777	248	156	443	151	306	51,999
1927:															
January	41,815	10,192	3,284	2,481	1,936	1,227	672	803	929	296	192	316	139	100	64,382
February	25,886	7,692	3,263	3,103	2,620	1,902	601	907	460	502	152	336	146	210	47,780
March	32,752	9,049	2,050	3,475	3,760	1,578	852	784	780	454	86	385	137	127	56,269
April	44,627	7,875	2,310	2,393	1,509	2,181	781	1,972	762	448	58	230	177	218	65,541
May	33,736	2,896	2,006	3,380	2,519	1,084	918	887	694	626	-57	335	155	223	49,402
June	31,276	2,282	2,387	3,632	2,086	798	942	1,506	557	583	-17	243	164	183	46,616
July	35,719	1,116	2,384	2,899	2,104	1,505	1,007	415	900	429	66	227	177	236	49,184
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	386	650	604	-63	312	138	123	47,785
September	29,801	7,806	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300	47,028
	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,492	636	4,224	2,055	2,672	627,785
1928:															
Jan.	37,552	1,921	1,764	2,485	2,290	1,361	546	572	802	589	52	261	335	376	50,906
Feb.	30,926	3,143	2,526	2,984	2,553	1,258	655	194	616	599	98	307		297	
Mar.	36,970	3,179		3,521		1,707				816	95				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—United Kingdom exports to Russia, and beginning with October, 1927, exports from the United States to Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation: such imports amounted to 4,305 tons in 1926 and to 5,019 tons in 1927.

BOOK REVIEWS

STOCK GEARS. Catalog and Price List of the Grant Gear Works, Boston, Mass. No. 50. 1928. 132 pp.

The catalog constitutes a very complete handbook on gears for all purposes and contains detailed tables and charts which cannot fail to be helpful to the factory engineer as well as the purchasing agent. Besides gears the company manufactures a full line of sprocket and steel roller chains, worm reduction units and flexible couplings. The company is a well known supplier to rubber factories.

YEAR BOOK, 1928. The Tire and Rim Association of America, Inc., Cleveland, Ohio. April, 1928. 114 pp.

Besides the statistical data contained in this volume on the number of rims inspected and approved over the period of the existence of the Association, the volume contains very full and detailed information on the various rim sizes with diagrams of standard dimensions and tables showing the correct rim equipment on the various makes of cars and trucks. Load and inflation charts are also included.

STANDARDS YEAR BOOK, 1928. Prepared by the Bureau of Standards, Department of Commerce. Washington, D. C. $1.00. 400 pp.

The Standards Yearbook for 1928 outlines the standardization activities and accomplishments of not only the bureaus and agencies of the Federal Government, including the Bureau of Standards, but also those of States and municipalities. It also gives a resume of the standardization work of scientific and technical societies and trade associations.

It is of special value to manufacturers, industrial experts, engineers and purchasing agents. It informs the manufacturer of the current standardization movements affecting his industry and the purchasing agent of the new standard specifications. It informs scientists as to current research projects.

RUBBER AND THE HOME. Issued by the Rubber Growers' Association, Inc., 2 Idol Lane, London. 1928. 64 pp.

With a view to acquainting the general public with the more recent domestic applications of rubber and rubber manufactured goods the Rubber Growers' Association has recently published this interesting and well illustrated brochure. It is surprising to the layman to note the multitude of uses to which rubber can be put in the household and the number of products made to reduce noise and breakages, banish fatigue, prevent shocks and jars and render the housewife's duties a pleasure. Copies of the booklet can be secured free of charge on application to the secretary of the Association in London.

YEAR BOOK OF THE AMERICAN ENGINEERING STANDARDS COMMITTEE, 1928. Published by American Engineering Standards Committee, 29 West 39th Street, New York City. 88 pp.

The new annual publication of this important committee describes the standardization activities of the past twelve months. Forty-nine new standards and 40 new projects are listed for numerous branches of industry and engineering, including mechanical, civil, electrical, mining, wood, textiles and safety. In all, the American Engineering Standards Committee has adopted 111 national standards up to the present time and is now working on 164 other standardization projects. Continual contact is maintained by the Committee with 19 national standardization bodies in foreign countries, with the constant exchange of standards and specifications. A table of Preferred Numbers, providing a scientific system for determining the sizes of thousands of common commodities, is one of the new standards which is expected to help lessen enormous wastes in industry by eliminating hundreds of needless sizes.

Copies of the Year Book may be obtained on request to the American Engineering Standards Committee, 29 West 39th Street, New York City, N. Y.

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